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THE JOURNAL OF COMPARATIVE MEDICINE AND VETERINARY ARCHIVES. PHILADELPHIA.

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OCTOBER, 1894.

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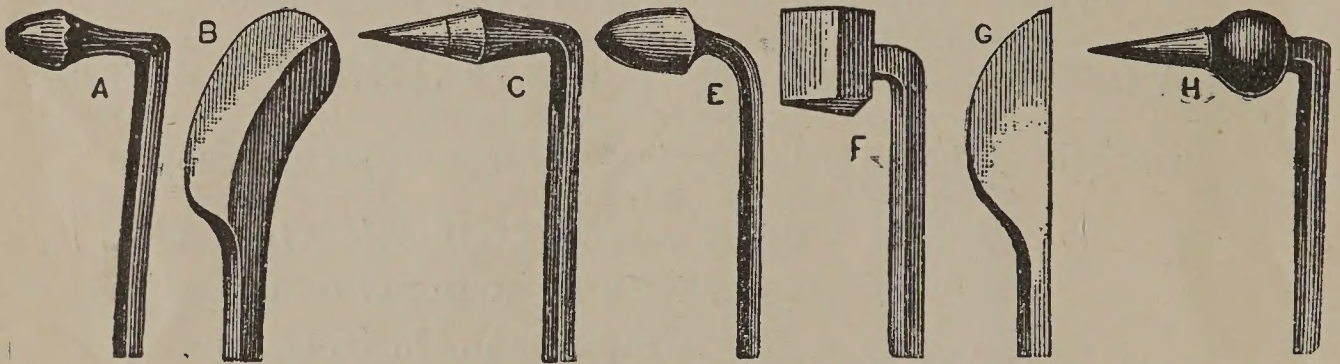
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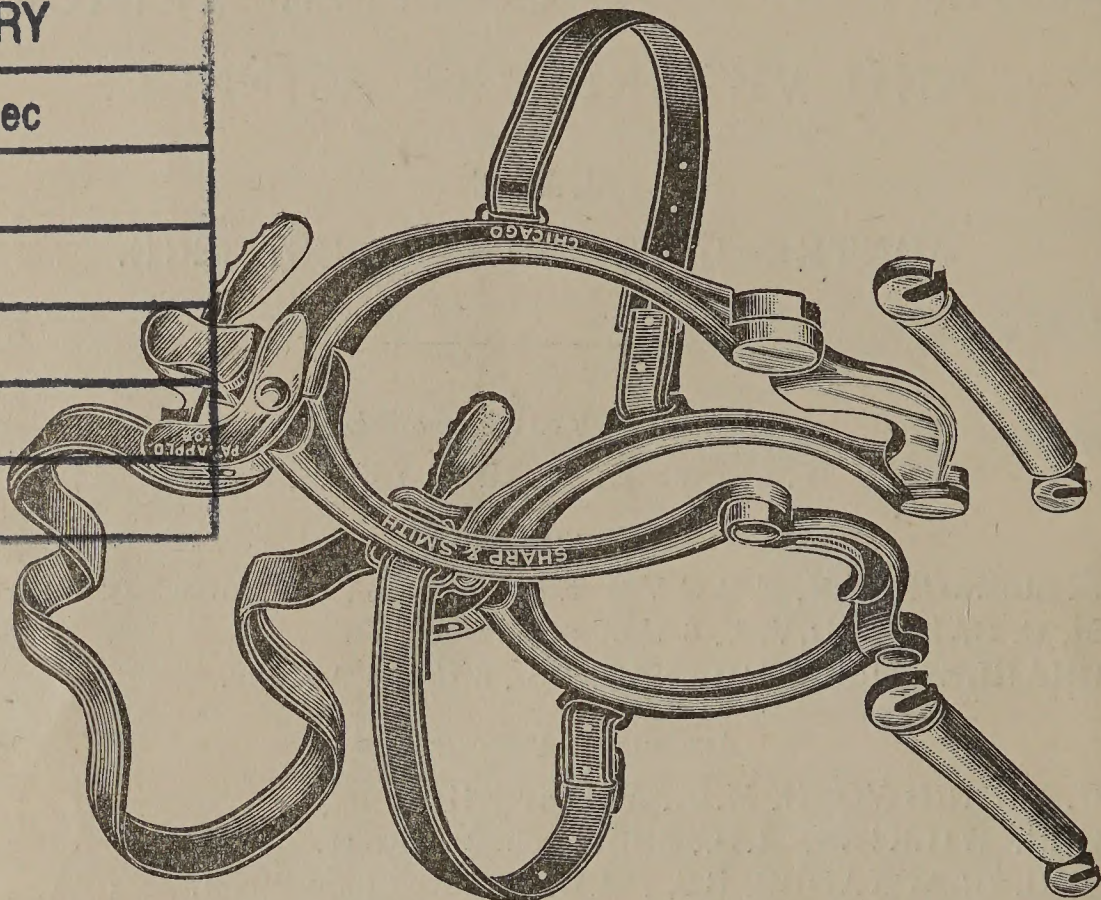
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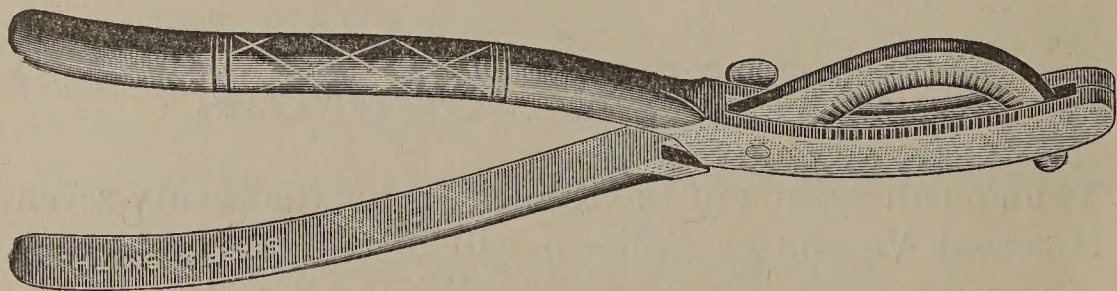
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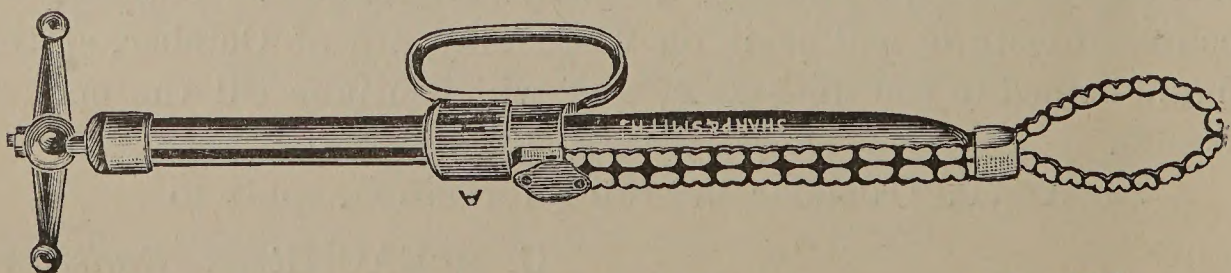


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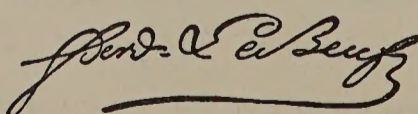
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No. 5.

THE ANATOMY OF THE LARGE AMERICAN FLUKE
(*FASCIOLA MAGNA*), AND A COMPARISON
WITH OTHER SPECIES OF THE
GENUS *FASCIOLA*, S.ST.

BY CHAS. WARDELL STILES, PH.D.,
Zoölogist, Bureau of Animal Industry.

CONTAINING ALSO A LIST OF THE CHIEF EPIZOÖTICS OF
FASCIOLIASIS (DISTOMATOSIS) AND A BIBLIOGRAPHY
OF *FASCIOLA HEPATICA*.

BY ALBERT HASSALL, M.R.C.V.S.

(Continued from page 243.)

II. *Fasciola hepatica* L., 1746 et 1758.

PLATE III.

This species has been so carefully studied by so many authors that it is useless to repeat the details of the anatomy in this paper. It will suffice for present purposes if the synonymy, hosts, geographical distribution, literature, specific diagnosis and descriptions of the intermediate hosts are given.

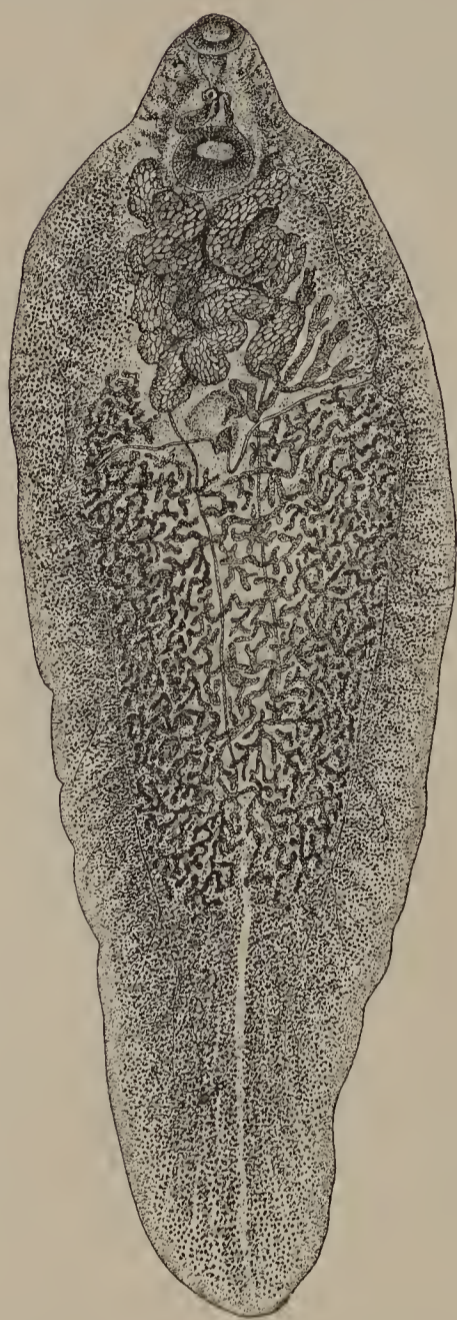


PLATE III.

FASCIOLA HEPATICA L.

Fig. 1. American specimen of *F. hepatica* from cattle. Stained preparation to show the internal anatomy. The intestinal system can be seen only in the anterior conical portion. The genital organs can be made out by comparing this figure with Plate I, Fig. 3. In the latter figure, however, the ovary is dextral, in this figure it is sinistral.

SYNONYMY:

- 1746 et 1758, *Fasciola hepatica* L.;
- 1782, *Planaria latiuscula* Goeze;
- 1786, *Distoma hepaticum* Abildg.;
- 1789, *F. humana* Gmelin;
- 1803, *F. lanceolata* Rud.;
- 1845, *Distoma* (*Cladocœlium*) *hepaticum* Duj.;
- 1845, *Fasciolaria hepatica* (Anonymous);
- 1884, *Distomata hominis* Taylor;
- 1889, *Distomum* (*Fasciola*) *hepaticum* R. Lkt.;
- 1890, *D. caviæ* Sons ;
- 1892, *Cladocœlium hepaticum* Stossich.

COMMON NAMES:

- English —The common liver-fluke, liver-fluke;
- German—Leberegel, Leberwurm, Schafegel;
- Dutch —Botten, Leverworm;
- Danish—Faareflynder;
- Swedish —Levermask;
- French—Douve hepatique, fasciole;
- Italian—Biscuola, distoma epatico;
- Spanish—Caracolillo.

HOSTS:

- Man (*Homo sapiens*);
- Common European squirrel (*Sciurus vulgaris*);
- European beaver (*Castor fiber*);
- Tame rabbit (*Lepus cuniculus domesticus*);
- Wild rabbit (*L. cuniculus ferus*);
- Hare (*L. timidus*);
- Cat (*Felis domestica*);
- Swine (*Sus scrofa*);
- Egyptian buffalo (*Bos bubalus*);
- Cattle (*B. taurus*);
- Argale sheep (*Ovis argali*);
- Domestic sheep (*O. aries*);
- Goat (*Capra hircus*);
- Gazelle (*Gazella dorcas*);
- Roe deer (*Capreolus caprea*);
- Fallow deer (*Cervus dama*);
- Stag (*Cervus elaphus*);
- Blue bull (*Bosephalus tragocamelus*);
- Virginian deer (*Cariacus virginianus*);

Bactrian camel (*Camelus bactrianus*);
 Ass (*Equus asinus*);
 Horse (*E. caballus*);
 Sword-fish (*Orca gladiator*);*
 Great gray kangaroo (*Macropus giganteus*).

*Leuckart once gave me two specimens of a fluke, which I still have in my possession, labelled "Leber, Schwert-fisch." I am unable to distinguish this fluke from *F. hepatica*. I assume that this "Schwert fisch" is *Orca gladiator* rather than *Xiphias gladius*, as all the other hosts of *F. hepatica* are mammals.

GEOGRAPHICAL DISTRIBUTION.—This species is almost cosmopolitan, being recorded from all the countries of Europe; Asia (India); Africa; Australia; Sandwich Islands; South America (Buenos Ayres and elsewhere). In North America we have positive proof of its occurrence in Long Island, N. Y. (Law); Chicago, Ill., cattle came from Texas (Stiles); California (Curtice); Arkansas (Dinwiddie); Texas (Francis, Detmers); Louisiana (Wheeler). "Rot" is recorded in many other localities, but the term "Rot" in American literature covers a multitude of diseases.

SPECIFIC DIAGNOSIS.

F. hepatica L. 1746 et 1758.—Body pale brown, leaf-like, flattened, 18-51 mm. long by 4-13 mm. broad; the anterior 3-4 mm. forms a rather thick, conical portion which is followed by a large, flat, leaf-like body of elongate-oval form; this latter widens rapidly to the maximum breadth and then decreases gradually in width to the posterior end which is bluntly pointed; cuticle is covered with numerous spines placed side by side in alternating rows; oral sucker is anterior, round and terminal, but inclines ventrad; acetabulum about 3-4 mm. caudad of oral sucker, with which it closely agrees in size; genital pore median, about half way between oral sucker and acetabulum; œsophagus rarely over 1-1½ times as long as the pharynx; intestine dendritic; cirrus frequently extruded from pore and then recurved; testicles profusely branched, situated for the greater part posterior to transverse vitello-duct. Vulva at side of cirrus; uterus forms a rosette with its numerous coils, and is frequently visible to the naked eye as a dark brown spot immediately posterior to the acetabulum; ovary branched, anterior of transverse vitello-duct; vitellogene glands profusely branched, and occupy the entire margin of the body from acetabulum to posterior extremity; they lie dorsally as well as ventrally of the intestine, becoming wider posteriorly. Oviparous.

Eggs oval, 0.13-0.14 mm. long by 0.075-0.09 mm. broad; *miracidium* conical, ciliated, with oral papilla, two cup-shaped eyespots, and rudimentary intestine; metamorphosis (sporocyst, redia, cercaria) takes place in small snails of the genus *Limnæa* (*L. truncatula* and others); *cercaria* whitish, owing to excessive development of the capsule glands; encysts upon plants.

THE INTERMEDIATE HOSTS OF *F. HEPATICA*.

PLATE IV.

It was shown by Leuckart and Thomas that in Europe the intermediate host for this fluke is a small swamp-snail, *Limnæa truncatula*; Leuckart also showed that the rediæ (but not the cercariæ) would develop in the young of another species of snail, *L. peregra*, and quite recently Lutz ('92 and '93) has shown that in Oahu and Kani (Sandwich Islands) two other snails may serve in this capacity, *i. e.*, *L. oahuensis* Souleyet and *L. rubella* Lea. In the case of *L. oahuensis*, Lutz states that "the infection can take place only in young specimens." None of these four very closely allied species are recorded for America, and yet we find *F. hepatica* in both North and South America, so that we must either have on this continent some other species of snail which may act as intermediate host, or some of the species described in America must be identical with some of the above-named forms.

The forms which would especially fall under suspicion are *L. humilis* Say in North America, and *L. viator* Orb. in South America.

This report is not the place to discuss the question as to whether *L. truncatula*, *L. peregra*, *L. oahuensis*, *L. rubella*, *L. humilis* and *L. viator* represent six well established species or not, as that is a matter for conchologists to decide; suffice it to say that specialists in conchology have described snails under these names; that the forms are all so very closely related, that a zoölogist would not commit a very grave offense against systematic zoölogy if he were to consider them as varieties of two or three species; that the forms described under the names *L. truncatula*, *L. oahuensis* and *L. rubella* are known to serve as intermediate host for the parasite now under discussion; that in Europe the rediæ (but not the cercariæ) develop in *L. peregra* and that it is probable, though not demonstrated as yet, that *L. humilis* is intermediate host for North America and *L. viator* for South America.

As these snails form the intermediate host of a dangerous, in



PLATE IV.

INTERMEDIATE HOSTS OF FASCIOLA HEPATICA.

- Figs. 1 a-c. *Limnæa oahuensis*, after Souleyet. Fig. c nat. size, a-b enlarged.
 Figs. 2 a-c. *L. viator*, after d'Orbigny. Nat. size and enlarged.
 Figs. 3 a-b. *L. peregra*, after Lkt. Nat. size and enlarged.
 Figs. 4 a-b. *L. truncatula*, after Lkt. Nat. size and enlarged.
 Figs. 5 a-j. *L. humilis*, after Binney. Nat. size and enlarged.

many cases fatal parasite, they must be included among the worst enemies of the stock-raiser. On that account, and since our experiments with *F. magna* will be greatly influenced by the facts known in regard to the development of *F. hepatica*, the intermediate hosts in all probability being closely allied animals, it has been thought best to give the descriptions, etc., of all the snails which are known or supposed to act as intermediate hosts for *F. hepatica*.

The systematic position, and at the same time a certain amount of the anatomy of these mollusks may be seen from the following synopsis, based upon the writings of Gray ('57), Binney ('65), Souleyet ('52), Lea ('41), Jeffreys ('62), d'Orbigny ('35), Westerlund ('85) and others.

J. E. Gray.—Manual of the Land and Fresh-Water Shells of the British Islands. London, 1857.

W. G. Binney.—Land and Fresh Water Shells of North America. Part II. Smithsonian Misc. Collections, 143. Washington, 1865.

Souleyet.—Voyage autour du Mond, sur la Corvette La Bonite. Vol. II. 1852.

Lea.—On Fresh Water and Land Shells; Proc. American Phil. Soc. 1841.

Jeffreys.—British Conchology. Vol. I. 1862.

d'Orbigny.—Voyage dans L'Amerique Méridionale, 1835-1843.

C. A. Westerlund.—Fauna der in der Paläarctischen Region lebenden Binnenconchylien. II. 1885.

MOLLUSCA.—Class GASTROPODA. Mollusks with a distinct head, which is generally provided with tentacles and eyes; provided with a single median muscular foot with a broad sole, (*seldom with a laterally compressed fin or heel-like foot); the undivided mantle frequently secretes a spirally twisted (or plate-shaped shell); pallial cavity lateral and dorsal; mouth with jaws and tongue; respiration through lungs (or gills); hermaphroditic (or dioecious).

Order, PULMONATA.—Land or fresh water snails, (naked or) with shells; palial cavity lies on right side, as a rule anterior to heart, and is arranged for breathing air; true operculum absent; hermaphrodites.

Sub-order, BASOMMATOPHORA.—Eyes on the median side or at the base of the tentacles; tentacles can be contracted but not invaginated; labial tentacles absent; a well-developed external shell always present; genital openings separated.

“LIMNÆADÆ.—Animal with an elongate foot, a more or less conical spiral body, a short muzzle, with dilated lips and compressed tentacles, with the eyes near the inner side of their base;

*Statements in parentheses do not apply to *Limnæa*.

the mantle, which covers the body, has a thin edge and is protected by a variably shaped pale uniform colored shell, which is clothed with a hard olive periostracum" (Gray p. 196). Genital openings close to each other, the male opening nearer the tentacles, the female opening nearer the breathing pore; jaw composed of one or of several—3—pieces.

"They live in ponds and ditches, often floating on the surface of the water, their back downwards, or crawling on the mud at the bottom, or on aquatic plants, but always coming to the surface to respire." (Gray p. 196.)

"The family contains nine genera, which may be thus distinguished:

- a. Shell ovate, spiral; pillar with an oblique plait.
 1. *Limnæus* [*Limnæa*]. Shell rough; inner lip simple.
 2. *Amphipeplea*. Shell polished, thin; inner lip expanded.
- b. Shell conical, recurved; apex oblique.
 3. *Ancylus*. Apex of the shell to the right.
 4. *Velletia*. Apex of the shell to the left.
- c. Shell ovate, sub-spiral; pillar smooth.
 5. *Otina*.
- d. Shell ovate, spiral; pillar simple.
 6. *Physa*. Inner lip expanded.
 7. *Aplexus*. Inner lip not expanded.
- e. Shell discoidal.
 8. *Planorbis*. Cavity of shell simple; mouth roundish or sub-quadrate.
 9. *Segmentina*. Cavity of shell divided by cross septa; mouth triangular.

"Tentacles short, compressed, triangular, without any auricle at the base; jaws 3, smooth; shell oblong, spiral. (*Limnæana*.)

1. LIMNÆA* (Mud Shell). "Animal with a short broad foot, broad short compressed tentacles, without any auricles at the base, a large upper and two small rudimentary lateral jaws, a large central spiral body, and a simple-edged mantle, covered by an external ovate, thin, dextral, transparent spiral-shell with an ovate mouth, having a single oblique plait on the middle of the column running into the axis.

"Limnæa has a small central tooth, as it were squeezed up between two very large lateral ones, each primary lateral having a very large apex internally, with a small external one, while at the edge they have altered to one thick prolonged apex projecting inwards and irregularly lobed on its upper edge." Gray, p. 199.

"The apex of the shell is often eroded or truncated; that is to

*The generic name has been spelt by authors in no less than nine different ways; but the correct orthography is undoubtedly *Limnæa* (from *λιμναῖος*—inhabiting marshes) as proposed by Rang.—Jeffreys, p. 101.

say, as the upper part of the body is withdrawn from the tip, and the body moves forwards into the larger part of the shell, it forms a septum behind, and the part that is thus separated eventually falls off." Gray, p. 200.

The Limnæi principally feed on the slimy matter which covers sticks, shells, and stones, beneath the water and on the mud, which is constantly found in the intestines. (Haldemann.)

Generic diagnoses of the genus *Limnæa* given by other authors differ slightly from the one just quoted; Gray's description will answer for all practical purposes, but as a comparison, and as the most recently revised diagnosis of the genus, the following is added from Westerlund ('85).

Gen. *Limnæa* (Brug.) Rang. Thier dick, Mundlappen vorn ausgerandet; die zwei Fühler zus.-gedrückt, dreieckig, kurz, mit den Augen innen an der Basis; Fuss keilfg., vorn abgestutzt, hinten spitz zugerundet; Mantel ganz eingeschlossen; Kiefer hornig, dreitheilig, mit breitem Mittelstücke u. schmalen, etwas gebogenen Seitenstücken; Zunge blattartig, vorn breit, hinten zus.-gelegt; die Mittelzähne s. klein, mit zwei Nebenhäckchen, die zahlreichen Seitenzähne grösser u. gesägt.

Gehäuse meist dünnschalig, mit Naberspalt, ohrfg. o. eirund bis thurm o. spindelfg.; Umg. schnell zunehmend, der letzte oft s. weit u. fast das ganze Geh. bildend, dann das Gew. s. kurz, o. Gew. lang thurmfg. ausgezogen; Mund. weit, gerundet bis länglich eifg., Spindelsäule oft frei hervortretend, bogig, Spindelumschlag lamellenartig, anliegend, Mundsaum einfach, scharf.

Syn. 1753 *Auricula* Klein—1758 *Helix* pr. p. L.—1774 *Buccinum* pr. p. Müller—1778 *Turbo* pr. p. Da Costa—1791 *Lymnea* Brug.—1799. *Lymnæa* Lam.—1801 *Limneus* Drap.—1810 *Lymnus* Montf.—1815 *Lymneus* Biard.—1817 *Limnæus* Cuv.—1826 *Limnea* Desh.—1829 *Limnæa* Rang --1841 *Lymnæus* Villa.

Subgenera:—

1. *Lymnus* Montf. Geh. festschalig, verlängert-eifg., mit gethürmtem, s. spitzem Gew., das meist von der Mündungslänge ist o. länger; Umg. typisch bei reifen Ex. 7-8, s. wenig gewölbt, anfangs langsam, dann s. rasch zunehmend, der letzte gross, aufgeblasen, m. o. w. ausgezogen.—Sp. 1.

2. *Gulnaria* Leach. Geh. meistens dünnschalig, mit kurzem o. sehr kurzem, öfters zugespitztem Gew.; Umg. 4-5, der letzte s. gross u. aufgeblasen, den weitaus grössten Theil des Geh. einnehmend. Münd. s. gross, gerundet,—selten Geh. festschalig, eifg., mit kegelfgem Gew. u. spitzeifger oft weissgelippter Münd., Umg. 4-5, der letzte nur convex.—Sp. 2-6.

3. *Limnophysa* Fitz. Geh. meist dickschalig, verlängert eifg., mit konischen o. thurmfgem Gew., das meistens länger, zuweilen viel länger als die Münd. ist. Umg. 7-8, langsam zunehmend, der letzte ausgezogen, wenig gewölbt; Münd. meist mit zweifarbigem (nach innen weisser, nach aussen rothbrauner) Lippe.—Sp. 7.

4. *Leptolimnea* Swains. Geh. cylindrisch-thurmfg. Umg. 7-8, s. langsam zunehmend; Münd. klein, kaum ein Drittel der Gehäuselänge, innen meist mit glänzend weisser Lippe.—Sp. 8.

5. *Fossaria* W. Geh. klein, länglich-eifg., dünnschalig, mit m. o. w. offenem Nabelspalte; Gew. spitzkegelfg., etwas länger als die Münd.; Umg. 5-6, s. langsam.

zunehmend, stark gewölbt, der letzte meist auffallend weiter als die übrigen; Naht tief eingeschnürt. — Sp. 9-II.

6. *Tanousia* Bgt. Geh. klein, gedrunen, konischeifg., mit dem letzten Umg. erst s. aufgeblasen, dann allmählig verschmächtigt dass die Münd. s. eng wird; Münd. innen mit einer zus.-hängenden Lippe. — Sp. 12. Westerlund p. 23-24.

1. *Limnæa truncatula** (Müller). Pl. IV, Fig. 4. "Body dark brown or grey, of a lighter color on the lower side, covered with fine black specks, tentacles short, but slender, rounded at their tips; eyes nearly sessile: foot rather short, marked with milk-white spots, which are scattered and larger than the black specks, nearly truncate in front, gradually narrowing and abruptly rounded behind.

"Shell oblong-conic, turretted, rather solid for its size, glossy, yellowish-brown or horn colour; epidermis thin: whorls 5-6, rounded and convex, but compressed in the middle, so as to make the top of each appear somewhat truncate; the last whorl occupying about three-fifths of the shell: spire abruptly tapering to a rather fine point: suture extremely deep: mouth oval, scarcely contracted on the inner side: outer lip sharp: inner lip continuous with it and reflected on the columella, behind which is a distinct umbilical chink: fold rather slight but thick. L. 0.4. B. 0.2. (in)" (3.5-1.5 mm. long by 1.8-5 mm. broad).

"Var. 1. *major*. Shell larger: whorls more swollen and the last considerably exceeding the usual proportion of size.

"Var. 2. *elegans*. Shell much larger, more solid and slender, greyish-white, marked with coarse spiral ridges: spire much produced: suture oblique: outer lip thickened. L. 0.6. B. 0.225" (in). (15 mm. long by 5 mm. broad).

"Var. 3. *minor*. Shell much smaller, thinner and semi-transparent, dark horn colour, marked with stronger and closer longitudinal striæ. L. 0.285. B. 0.165." (in) (7 mm. long by 4 mm. broad).

"Var. 4. *albida*. Shell smaller and white."

"Var. 5. *scalariformis*. Shell smaller: whorls nearly disunited."

"Var. 6. *microstoma*. Shell smaller and narrower: whorls more swollen: mouth contracted." J. G. Jeffreys. '87. I. pp. 115-117.

This snail is found on the banks of slow and muddy rivers and streams, marshes, ditches, etc. It is nearly amphibious in its

* Synonymy:—*Buccinum truncatulum* Müller; *Helix fossaria*; *Lymnæus minutus* Drap.; *Lymnæus fossarius*; *Limnea fossaria*; *Limneus minutus*; *Limnæa truncatula*.

Westerlund gives the following specific description recognizing 25 varieties:—

L. (Fossaria) truncatula. Geh. dünn, feingestreift, horn-braun; Umg. m. o. w. wendeltreppenartig abgesetzt; Münd. eifg., oben stumpfeckig, in der Regel kürzer als das Gew., Mündungswand s. quer, Spindel fast gerade herabsteigend, Munds. gerade. G. 9: 4., M. 4 mm. (Europa, Nordafrika, Nord. u. Westasien).

habits, being found more frequently out of the water than in it. It deposits its spawn on the mud, which it generally inhabits, and not like its congeners on stalks and under the leaves of water-plants. It is found from Siberia to Algeria and Sicily, occasionally in elevated spots.

2. *L. peregra** (Müller). Puddle Mud Shell (Pl. IV, Fig. 3). "Body yellowish-grey, with a brown or olive green tinge, mottled with black and covered with small yellow or milk-white, and black specks: tentacles diverging from each other at nearly a right angle: eyes distinct: foot oblong, very broad, nearly truncate in front, and obtusely rounded behind."

"Shell obliquely ovate, thin, moderately glossy, semi-transparent, yellowish-horn colour, irregularly striate by the lines of growth, and closely and microscopically striate in a spiral direction, with occasionally a few indistinct spiral ridges and pitmarks: epidermis rather thin: whorls 5, convex, the last occupying three-fourths of the shell: spire produced and pointed: suture rather deep: mouth large, oval, very little contracted above by the projection of the penultimate whorl: outer lip thin, slightly reflected: inner lip folded on the columella and thickened, forming behind it a slight umbilical cleft: fold rather prominent and curved. L. o. 75. B. 0.425. (in.)" (8-20 mm. long by 4-10 mm. broad).

"Var. 1. *Burnetti*. Body a little broader than that of the typical form, dark olive, spotted with opaque yellow: mantle nearly black, with a few paler spots. Shell rather globular and solid, of a dull aspect, yellowish brown, closely and strongly striate in the line of growth: epidermis rather thick: the last whorl nearly covering all the others: spire exceedingly short, nearly truncate and almost intorted. L. o. 725 in. B. 0.65 in." (18 mm. long by 16 mm. broad.) Syn. *Limnæa Burnetti* Alder; *Limnæus Burnetti* F. & H.

"Var. 2. *lacustris*. Body of a darker colour than usual. Shell resembling that of the last variety, but it is much smaller and more glossy, and has strong and regular transverse grooves, and the spire is not quite so short nor inclined to be intorted. The shell is often eroded. Syn. *Gulnaria lacustris*, Leach."

**L. (Gulnaria) peregra* Westerlund.

Synonymy after Gray ('57): *Buccinum peregrum* Müller; *Bulimus pereger* Brug.; *Helix peregra* Gm.; *H. putris* Penn.; *Lymnæa putris* Flem.; *Limnæus pereger* Drap.; *Lymnæa peregra* Lamarck; *Gulnaria peregra* Leach; *Lymnæus vulgaris* Pfeiffer; *Limnæus opacus* Ziegler; *L. fuliginosus* Z.; *L. callosus* Z.; *L. consobrinus* Z.; *L. nitidus* Z.; *L. corneus* Z.; *L. solennis* Z.; *Buccinum rivale* Studer; *Limnæa limosa* and *peregra* Mog.-Tand.; *Limnæus fontinalis* Stud.; *Limnea intermedia* Ferus; *L. thermalis* Boub.; *L. Nouletiana*, and *Frencaleonis* Gass.; *L. glacialis* Dupuy; *Turbo trianfractus* Da Costa; *Helix inflata* Gm.; *H. teres* Gm.; *H. sículus* Dillw.; *H. auricularia* B. M. & R.; *Bulimus sículus* Brug.; *H. auricula junior* Dillw.; *Lymnæa intermedia* Lam.

"Var. 3. *lutea*. Shell remarkably solid, having a very short spire of 3-4 whorls. Syn. *Helix lutea*."

"Var. 4. *ovata*. Body of a paler colour. Shell ampullaceous and rather thinner than usual: whorls exceedingly convex, the last being larger in proportion to the rest: spire very short: suture deep: mouth very large. Syn. *Limneus ovatus* Drap."

"Var. 5. *acuminata*. Shell resembling the last variety in all respects, except in having a more produced spire and a smaller mouth."

"Var. 6. *intermedia*. Shell rather compressed towards the front margin and thinner than usual: spire more produced: mouth expanded. Syn. *Limnea intermedia* Fer."

"Var. 7. *oblonga*. Shell oblong and compressed in front."

"Var. 8. *labiosa*. Shell smaller, having the outer lip remarkably expanded and reflected. L. 0.5. B. 0.35 in." (12.5 mm. long by 8.75 mm. broad.)

"Var. 9. *picta*. Shell rather smaller than the last, and beautifully marked by alternate bands of brown and white, which are sometimes confluent."

"Var. 10. *maritima*. Shell dwarfed, rather solid: spire produced: suture deep. L. 0.4. B. 0.225 in." (10 mm. long by 5.6 mm. broad.)

"Var. 11. *Succineæformis*. Shell shaped like a Succinea, and very thin: whorls 4: spire small and oblique."

"Var. 12. *decollata*. Shell more or less eroded: spire truncate."

"Var. 13. *sinistrorsa*. Shell resembling a *Physa* in having the spire sinistral or reversed, rather solid: the spiral ridges distinct and prominent. Syn. *Limnæus lineatus*."

"Var. 14. *scalariformis*. Shell oblong, with deep and regular transverse striæ; whorls more or less disjoined: suture consequently very deep." Jeffreys p. 104-108.

This species is very widely distributed, being found from Siberia to Sicily. It lives in still or slowly running waters. It is nearly amphibious and may be met with some distance from the water. It is very prolific, laying about 1300 eggs in a season, the eggs being in clusters of 12-180. *L. peregra* is both zoö- and phytophagous, and is extremely variable, and no less than 30 species have been made out of its varieties.

3. *L. humilis** Say (Pl. IV, Fig. 5).—"Shell ovate-conic, thin, translucent, with slight wrinkles; volutions nearly six, convex, terminal one very minute; suture well indented; aperture about equal in length to the spire; labium with an obvious plate of calcareous deposit; a distinct and rather open umbilical aperture; color pale reddish-white or yellowish-white. Total length seven-twentieths of an inch (8.75 mm.). Ranges from Maine to Georgia and Kansas to Lake Superior." W. G. Binney. Land and Fresh Water Shells of North America, 1865, p. 65.

*Synonymy after Binney: 1822, *L. humilis* Say; 1825, *L. modicella* Say; 1841, *L. parva* Lea; 1841, *L. plica* Lea; 1841, *L. griffithiana* Lea; 1841, *L. planulata* Lea; 1841, *L. rustica* Lea; 1841, *L. exigua* Lea; 1841, *L. curta* Lea; 1843, *L. linsleyi* de Kay.

4. *L. oahuensis** Souleyet. (Pl. IV, Fig. 1.)—Shell oblong-conic, wound right or left, thin, nearly translucent, of a tawny brown color, sometimes covered with a black and persistent coating; spire conical, generally eroded at the summit; whorls 4-5, depressed convex; mouth oval; internal lip reflected and adhering to the second last whorl; edge thin and sharp. Foot short and rather abruptly pointed posteriorly; the anterior border of the head slightly indented in the median line; tentacles are short, flattened, straight and terminated in a sharp point. Body is black.

Shell 12 mm. long by 9 mm. broad.

5. *L. rubella*† Lea. Body darker than that of *L. oahuensis*; feelers longer and more filiform, but thicker at the base, where they are triangular; teeth of radula similar to those of *L. oahuensis*. Shell sinistral, ovate-conic, thin, light and translucent with a reddish tinge; spire is short, suture shallow; whorls 5, convex. Aperture oval, 7.5 mm. Length 13 mm., breadth 6.5 mm.

The determination of the snails from the Sandwich Islands seems to be very difficult and the persons who have determined

*The original description reads as follows:

Lymnaea. testâ oblongo-conicâ, dextrâ vel sinistrorsâ, tenui, subpellucidâ, fuscâ, interdum nigratâ; spirâ conicâ; anfractibus 4-5; convexo-depressis; apice saepius eroso; aperturâ ovatâ; labio reflexo, adnato; labro tenui, acuto.

Coquille oblongue conique, dextre ou sénestre, mince, subtranslucide, d'un brun-fauve, parfois couverte d'un enduit noirâtre et persistant. Spire conique, à sommet le plus souvent rongé, et composée de quatre à cinq tours d'une forme convexe-deprimée. Ouverture ovale; lèvres interne réfléchie et adhérente à l'avant-dernier tour; labre mince et tranchant.

Cette espèce présente, comme nous venons de le dire, la particularité d'être tantôt dextre et tantôt sénestre. L'animal a le pied court et assez brusquement rétréci en pointe à sa partie postérieure; le bord antérieur de la tête est légèrement échancré sur la ligne médiane; les tentacules sont courts, aplatis, étroits et terminés en pointe aigüe. Toutes ces parties sont d'un gris moirâtre.

Dimensions de la coquille.—Longueur, douze millimètres; largeur, au dernier tour, neuf millimètres.

Cette Lymnée habite les ruisseaux de l'île Oahu (îles Sandwich); elle y est très commune." (Souleyet, Voyage autour du Monde, sur la Corvette La Bonite, Vol. II, p. 527. Pl. 29. Figs. 38-41. 1852.)

†Original diagnosis:—

Lymnea rubella.—Testâ ovato conicâ, tenui lævi, nitidâ, diaphanâ, rubella, imperforata; spirâ breviusculâ; sutûris parvis; anfractibus quinis, subconvexis; aperturâ subgrandi, ovatâ. *Hab.* Oahu. (Lea. On Fresh Water and Land Shells; Proc. Amer. Phil. Soc. 1841, p. 31.)

the specimens which Lutz describes have arrived at different results, as shown by the following table :

Lutz.	Böttcher.	Baldwin.	Streng.
<i>L. pereger</i> } L. No. 2. }	<i>L. oahuensis</i> Soul.	<i>L. turgitula</i> Pease.	<i>L. umbilicalis</i> Mögh.
L. No. 4.		<i>L. oahuensis</i> Soul.	<i>L. rubella</i> Lea.
L. No. 5.		<i>L. rubella</i> .	<i>L. sandwichensis</i> Phil.

Lutz's species Nos. 2 and 4 are the forms which serve as hosts for *F. hepatica*. To establish the proper synonymy of these animals does not come within the province of this report.

6. *L. viator** d'Orb., 1835 Body viridescent. Shell oblong, elongate, somewhat ventricose, very slightly umbilicate. thin, fragile, smooth or marked with very light lines of growth; spire more or less elongated, conical, very sharp at the tip; whorls 5, very detached, convex, separated by deep suture; mouth oval or almost round, with thin lips; columella curved, occasionally rather sinuous. Color, a uniform tawny gray. 8 mm. long by 4 mm. broad.

I am indebted to Dr. Dall of the Smithsonian Institution for the use of his private library in compiling the above data on these snails.

*D'Orbigny's description reads as follows:

L. corpore viridicente.

Testâ elongato-oblongâ, subventricosâ, subumbilicatâ, laevigatâ, tenui, livido-fuscescente; spirâ subelongatâ, conicâ, apice acuto, anfractibus quinis convexis; suturâ profundâ; aperturâ ovali; labro acuto. Long 8 mm.; lat. 4 mm.

Coquille. Oblongue, allongée, un peu ventrue, très légèrement ombiliquée, mince, fragile, lisse ou marquée de très légères lignes d'accroissement; spire plus ou moins allongée, conique, à sommet très-aigu; composée de cinq tours très détachés, fortement convexes, séparés par une suture très profonde; bouche ovale ou presque-arrondie, à bords minces; columelle arquée, quelque fois un peu sinueuse. Couleur: gris-fauve uniforme.

Cette coquille varie un peu selon les localités: aux environs du Callau, au Pérou, elle est plus allongée, à tour plus détaillés; tandis qu' en Patagonie et au Chili, elle est un peu ventrue, et ses tours sont moins convexes. Au premier aperçu, nous l'avons considérée comme une simple variété du *Limnæus minutus*, de France; mais en les comparant avec le plus grand soin, nous avons reconnu que notre *L. viator* est toujours moins allongé à proportion, beaucoup moins ombiliqué, et qu'il était de plus presque entièrement lisse; tandis que le petit *Limnæus* es un peu strié; néanmoins, il est peu d'espèces qui aient plus de rapports entr'elles.

Nous avons rencontré cette espèce en Patagonie, au 41 degré de latitude sud, sur les rives de Rio negro, à commencer de sept ou huit lieues au-dessus de son embouchure, jusque bien avant sur son cours; il y est très commun. Nous l'avons retrouvé ensuite au Chili, aux environs de Santiago et de Casa blanca, toujours dans les ruisseaux d'eau limpide. Lorsque, plus tard, nous avons recherché les mollusque des environs de Lima, nous avons encore recueilli cette espèce dans tous les canaux d'irrigation qui sortant du Rimac entourent la ville de Lima et celle du Callao; mais dans ces deux localités, tous les individus sont constamment plus allongés, à tours plus séparés que celle du Chili, et de Patagonie; et, vu la différence de lieu d'habitation, nous aurions été tenté d'en former deux espèces distinctes, si nous n'avions craint de trop multiplier les espèces; et si, d'ailleurs nous n'eussions pas reconnu que les individus des environs de Lima étaient aussi moins allongés, que ceux du Callao. Dès-lors, nous avons dû croire que des circonstances locales seules avaient influé sur ce léger changement de Formes. (d'Orbigny, Voyage dans l'Amerique Meridionale, p. 340. Plate 43. Fig. 1-3).

(To be Continued.)

THE INFLUENCE OF CLIMATE AND OTHER ENVIRONMENTS ON THE DISTRIBUTION AND CHARACTER OF DISEASE.*

BY W. L. WILLIAMS, V. S.

The influence of climate, housing, food, care and other surroundings induce marked changes upon the distribution and character of disease, whether among animals or mankind; and the student of pathology needs to weigh these forces carefully, that he may avoid error by arriving at conclusions based upon observations confined to a limited area.

Both in those diseases known to be transmissible and in those supposed not to be capable of passing from one animal to another we find many instances that the disease is narrowly confined to a limited area, and never seen outside of it. Others are usually confined to comparatively limited areas, passing rarely and spasmodically beyond their usual boundaries, soon to retreat therein again; others exist mainly in certain centers, with isolated cases disseminated over a large portion of, or the entire animal world; while others know no boundary, apparently, except that of animal life: all presenting interesting variations in character, the reasons for some of which we can know or estimate.

*Read at the Thirty-first Annual Meeting United States Veterinary Medical Association, September, 1894.

The study of the various influences controlling the distribution and character of disease belongs largely to the domain of philosophical medicine, and offers for consideration many highly interesting and instructive problems, but it is no less a part of practical medicine, giving new insight into many of these peculiar epizootics, as well as to a large number of extraordinary cases of common affections, which at times so baffle and worry the practitioner. The extraordinary case in one locality, under one class of conditions, frequently constitutes the ordinary disease under wholly different surroundings.

The study enlightens us too as to the etiology of many diseases, since we not infrequently find the prevalence of a disease in a certain locality attributed to certain well marked local environments, when in fact the same disease, and of like character, exists in regions where the supposed essential etiological factor of the former locality is wholly absent. So it is that we find our standard writers attributing a disease at times to some local cause, when a more general knowledge of the distribution of the disease would show them that it existed under conditions requiring some other explanation for its existence than that given.

Again, we find our writers describing symptoms of a disease as those characteristic of a malady, when in reality they are overlooking the essential characters, and are portraying vividly what they have seen in a limited area, perhaps in compass of a few square miles in a great city.

It is not deemed desirable to undertake the consideration of a great number of diseases, but rather a few important affections, which are more or less prevalent in the United States, which it is believed will serve as a ground work for an interesting discussion.

In order to secure as complete data as possible in the brief time at my disposal, letters were addressed to about one hundred of the leading veterinarians of this country, almost all to members of this Association, and representing, as nearly as possible, all sections of the United States, asking for their observations as to the influence of climate and other environments upon the distribution, character, course and termination of the following diseases: Glanders, tuberculosis, actinomycosis, bursattee, enzoötic spasm of the larynx, poll evil and fistulous withers, osteo-porosis, rhachitis, periodic or specific ophthalmia.

The responses to these letters were unexpectedly numerous, and were very gratifying in the amount of interest manifested, and the amount of valuable data contributed, and I wish to acknowl-

edge here, with sincere gratitude, what I have not been able to do individually, my obligations to my colleagues for their kind assistance in the preparation of this paper.

It will be noted that some of the diseases very markedly limited by geographical lines have not been considered in our list, although their behavior offers some very interesting points for study.

We are all very well aware of the closely defined area in which Texas fever is confined as an indigenous disease, its boundary being fixed fundamentally, to all appearance, by thermal conditions. The so-called loco disease of the dry regions of the West seems to be coexistent with the prevalence of the loco weeds, the *oxytropis Lamberti* and closely allied plants, although up to the present the relationship between the plant and the disease has not been defined.

Other diseases of a local character, such as "mountain fever" and "joke easy," or "kidney disease," prevalent in certain Rocky Mountain regions, which have been but indifferently or not at all described, depend apparently upon local conditions, the nature of which are at present not even surmised.

Other diseases depend for their distribution and character upon the density of animal kind, like hog cholera and bovine pleura pneumonia, and tend to pass over infected countries in rhythmic waves, the lowest point of prevalence and mortality following closely the decrease in numbers of animals, and the acquired immunity to a severe pestilence, to be again followed when the general conditions of the country are favorable to dissemination; animal numbers have increased and the disease in some focus has found favorable conditions for luxurious development, when the disease again spreads over a large area as a great epizoötic.

The distribution and character of other diseases are largely determined by the prevailing use to which animals are put, thus infectious abortion of cows predominates in dairying regions and far less frequently in localities devoted to the breeding of beef cattle. Again other diseases may exist without prejudice to the native animal in a country where it is indigenous, and become a virulent pestilence once it oversteps its indigenous territory; or susceptible animals are imported into its territory, like Texas fever and rinderpest.

Coming to the brief list of diseases we have selected to specially consider, first, in order of arrangement, is glanders, one

Influence of Climate on Distribution of Disease.

of the longest known, most carefully studied and most widely disseminated diseases of animals; running an indefinite, erratic course, assuming multitudinous forms, and offering, on the whole, one of our most interesting subjects from the standpoint now viewed. Glanders among solipeds is more or less prevalent in every country so far as known save Australia, irrespective of temperature, humidity, altitude or other climatic conditions. It attacks its victim in spite of food, housing, care, age or breed, yet its prevalence, transmissibility, character, duration are all as susceptible to the influence of such as is the most delicate barometer to changes in atmospheric pressure, and becomes so changed in aspect that there is no resemblance in any way save bacteriologically between a series of cases.

Fleming (1) notes that the disease is highly prevalent in Continental Europe and northern and eastern China, rare in South Africa, unknown in India except as an imported affection, and coming as a rule from Australia where the existence of the disease is denied. He also quotes Liquistin as stating that the disease was unknown in Mexico until introduced by the U. S. troops during the war with the country in 1847, but that failed to spread to any notable extent.

Prof. W. Williams (2) states that glanders is a disease of temperate climates, diminishing in prevalence in hot or cold countries.

Robertson (3) agrees substantially with Williams, adding two exceptions to the general rarity of glanders outside temperate climates by noting its prevalence in Norway and Java.

Friedberger and Fröhner (4), citing Krabbe, state that by statistics collected in 1857, 1873, that for each 100,000 horses there were annually found glandered in Norway, 6; in Denmark, 8.5; in Great Britain, 14; in Sweden, 57; in Wurtemberg, 77; in Prussia, 78; in Servia, 95; in Belgium, 138; in France, 1130; and in Algiers, 1548.

In the State of Illinois from 1886-1892 inclusive there were reported annually 13 glandered horses for each 100,000. Other figures of value in the U. S. were not available, and the prevalence of the disease can only be considered comparatively.

In the New England States, which are cool and not moist, the disease seems to be rare, and to pursue a mild, chronic course gen-

(1) Veterinary Science and Police.

(2) Principle and Practice Veterinary Medicine.

(3) Equine Medicine.

(4) Special Pathology and Therapeutics.

erally. In Maine, according to the cattle commissioner's report, there were destroyed in 1891 18 glandered animals, and in 1890 the same number. They claim, however, that a large percentage of cases were traceable directly to importation from Boston, Mass.

Dr. Choate (Lewiston, Me.) reports glanders of a mild, chronic type fairly common in his vicinity. Dr. Peters (Boston, Mass.) reports the disease rare. While Dr. Paige (Amherst, Mass.) reports it rare except in large cities.

Judging from the report of the Massachusetts Cattle Commissioners for 1887, glanders in a very mild, chronic form was quite prevalent among the street-car horses of Boston.

In a special report by Dr. Winchester it seems that 192 animals out of 1700 were quarantined as diseased or suspicious, out of which but 4 animals were killed, although Dr. Liautard had positively pronounced 31 glandered and 28 suspicious. Of the 192 animals quarantined 20 were released by Dr. Winchester's motion, while 162 were released by the Board over Dr. Winchester's protest, although this latter number included nearly all those positively condemned by Drs. Liautard and Huidekoper. It seems that acute, well defined cases were almost unknown in this outbreak, and that the quarantining of the affected and suspected animals by Dr. Winchester served evidently, as Dr. Huidekoper notes in his report of inspection, to ameliorate the symptoms, under the beneficent influence of rest, good food and improved hygienic conditions. There was a strong tendency, it seems, in these cases to spontaneous recovery, and it is well to note here that close quarantine, i. e., the withdrawal from labor, with good food and care, always tends in all localities to remission in symptoms and a tendency to recovery, either apparent or real, almost always the former, thus tending to bring the official veterinarian into disrepute, and by bringing about many apparent recoveries tends strongly to domicile and perpetuate the malady.

In New York and Brooklyn, according to Dr. Burns (Brooklyn), the disease is comparatively rare at present, doubtless due more to the influence of well enforced sanitary police regulations, than to climatic influences, the latter being quite favorable to the spread of glanders in a virulent form.

In Pennsylvania, Dr. Pearson (Phila.) reports the disease on the increase, but leaves us in the dark as to the type assumed; it is reported comparatively rare in Ohio by Dr. Howe (Dayton), and its prevalence at a ratio of 13 in 100,000 horses in Illinois, has already been noted.

Climatically, New York, Pennsylvania, Ohio, Indiana and Illinois may be grouped together as comparatively humid States, with sudden and great thermal variations, but generally neither excessively hot nor cold. The climate does not call for very warm stables, rendering the question of overcrowding and bad ventilation a minor one, and being highly productive and prosperous agricultural region, most horses are well fed and receive careful handling. The unfavorable climatic conditions are counterbalanced largely by favorable surroundings in other respects. In this series of States we find every possible type of glanders, the chronic prevailing, although the acute is not uncommon, mainly in the cities, and due evidently to overcrowded, unsanitary stables. In country districts, quite notably in central Illinois, many cases exhibit a mild type, with very distinct tendency to spontaneous recovery.

Animals, which from their history have evidently been affected for six or eight years, have at no time been incapacitated in the least for ordinary work, but have in every way, except occasional cough and slight nasal discharge, with slight tumefaction of submaxillary lymphatics and characteristic ulcerations, or cicatrices, given all evidence of robust health. Others have come under our observation where an entire stable of horses had become affected apparently with glanders, all alike in an acute form, with emaciation and profuse nasal discharge, some of which entirely recovered; others partially recovered and after two or three years were condemned and killed, while the recovered animals exhibited no signs of disease, although remaining in close contact with the animals plainly affected. Acute cases, apparently approaching rapidly a fatal termination, frequently turn under favorable conditions and make very marked improvement.

The laws for killing prevent opportunities for very extended observations.

In New York, Dr. Law (Ithaca) observed to me in a private conversation, that he had seen at Ithaca permanent recovery of the disease.

Wisconsin, Michigan and Minnesota probably differ but little from the series of States just considered. Dr. J. S. Butler (Minneapolis) noted that in his experience the disease is more prevalent and more acute in large cities, where horses are crowded in ill ventilated stables. He also remarks that in his locality, where the winters are cold, rather uniform and dry, the disease apparently remains latent in winter and develops in spring. This observa-

tion applies certainly, with some variations, to much of the territory considered, but not so evidently as Dr. Butler has observed, since in the more southerly States just considered the entire winter may be, and not infrequently is, almost throughout, very like the spring of Minnesota, cool, wet and variable. Hence, often the winter season is the period for greatest development in these localities, while a dry summer, with abundant food, may operate favorably.

In Missouri, Kansas and Arkansas horses, except in cities, are very little stabled, the climate being milder and no marked tendency to humidity, which condition seems to very markedly affect the type of glanders, the disease being quite thoroughly disseminated, but generally causing no great loss, spreading very slowly and attacking but few animals in a band. Dr. T. J. Turner (State Veterinarian, Columbia, Missouri) observes that, while widely disseminated, the disease is but feebly communicable, and assumes almost constantly the mild type in outdoor animals, and the acute type in those closely stabled. Dr. White (Sedalia, Mo.) reports the disease almost constantly mild and very feebly transmissible. Dr. Dinwiddie (Fayetteville, Arkansas) reports glanders in mules as generally a mild, chronic course, in direct contradiction to the generally accepted ideas of the disease in this animal in all parts of the world.

Dr. Mayo (Manhattan, Kansas) notes that the nasal discharge in glanders is less in his region, he thinks owing to a dryer atmosphere, than observed in more northerly and easterly States.

Dr. G. A. Johnson (Sioux City, Iowa) has observed the disease almost wholly in the chronic form, but notes no recoveries. Dr. W. B. Niles (Ames, Iowa) has noted the disease in the mild form, and during dry seasons has noted apparent recoveries, leading him to believe that under favorable conditions spontaneous recovery is quite possible.

In the South Atlantic and eastern Gulf States we meet with a warmer and more humid climate, solipeds generally are of less value, mules largely predominate, and as a rule they are not so well fed and cared for as in other sections considered.

Dr. Kilborne (Washington, D. C.) has found the disease quite prevalent in the District of Columbia, Maryland and Virginia, usually in a mild, chronic form. Under rigid sanitary laws the disease has decreased in the District of Columbia, from 78 cases in 1889 to one case every month or two at present. He has noted one case of spontaneous recovery from nasal glanders, two from

farcy, all proven cases of glanders, and the recovery for one year after disease seemed in every way complete.

Dr. Cary (Auburn, Alabama), comparing glanders in Alabama with his observations in Iowa and Illinois, finds the disease more virulent in the former State, owing to increased humidity, with heat.

Dr. W. B. Niles (Ames, Iowa), who has observed the disease in South Carolina and Iowa, finds that in mules in South Carolina it runs an acute course, while in horses he notes no difference in South Carolina and Iowa.

Dr. Tait Butler (Agricultural College, Miss.) reports the disease rare in his State. Prof. A. W. Biting (Florida) reports that in Florida isolated cases are rare, and acute in form. The diseased animals, if not already in their ownership, are soon transferred to negroes, who are usually poor care takers.

In humid regions along the Pacific Coast the disease is frequent and virulent.

Aside from some very small areas, we have briefly glanced over the United States, except the Rocky Mountain region and the high and to a great extent arid plains sloping from their base towards the Mississippi River, a large part of which is cold, some of it extremely so, all quite dry, even to converting much of it without irrigation into a great desert, the altitude varying from 2,000 to 8,000 feet, and horses kept generally in large bands, without stabling. They are usually placed in such environments as permit, with labor, the procuring of a liberal, if not abundant, supply of food. In this entire region the disease is very common, mild, but feebly contagious, and tends to recover spontaneously.

Dr. A. H. Baker (Chicago, Illinois), upon a trip to South Dakota in 1885, found glanders very prevalent, and was especially struck with the very mild type it assumed, horses doing their accustomed labor for seven or eight years without apparent detriment, and showing no constitutional defects whatever, yet by local lesions showing plainly and unmistakably that they were affected with glanders.

Dr. Hinebauch (Fargo, N. D.) reports the disease as assuming the same form in his State, and to this mild, largely latent type, rendering detection difficult, he attributes its wide prevalence. Dr. S. Stewart (Kansas City, Kansas), observing glanders along the Missouri River, Dakota to Arkansas, finds it in a very mild form, and has noted several apparent recoveries, either spontaneous or under indifferent treatment. Dr. Waugh (Allegheny, Pa.),

observing glanders in California, Arizona, New Mexico, western Texas and along the northern border of old Mexico, finds it prevalent among horses, mules and asses, being most rare in the latter, and assuming a very mild type. The acute form is rarely seen. This mildness Dr. Waugh attributes to the hot, dry climate, alkaline water, and grasses richly impregnated with mineral substances. Treatment appeared favorable, yet he failed to produce recovery in cases tried in New Mexico.

In the San Joaquin Valley of California glanders has recently prevailed very largely, and led Dr. Klench (*Am. Vet. Review*, Vol. XIII, p. 214) to contribute a very remarkable article upon the disease, under the name of general lymphangitis, giving as faithful description of glanders as can well be found in veterinary literature, in history, symptoms, termination, etc., yet holding, on the most palpably erroneous grounds, that the disease was not glanders. In this locality Dr. Waugh has noted spontaneous recovery in horses.

In Montana horses are ranged on lands 3,000 to 7,000 feet above sea level, have usually abundant food and a dry climate. The past year has been exceptionally wet, and as an immediate result glanders has developed more commonly than before, and in more severe form. Of 40 cases inspected three were acute in character, two common work horses, indifferently cared for, and one a draft stallion, kept stabled.

I had occasion to inspect some 2,000 range horses for glanders, at the annual round up, and while I found on the range 12 glandered animals, all but two of them had worked on valley farms where glanders existed, and where they had either contracted or developed the disease. Of the two unbroken range animals found affected, one was a two-year-old gelding, the other an aged brood mare affected for five years. Both were in first-class general health, and showed but slight local lesions. In most of the animals affected for the longer periods this disease was uniformly of a very mild type. One recent case I have watched for a few months was severely affected constitutionally and locally, in January, this year, but has rapidly improved and is now apparently well, except small cicatrices in nostril, and very slight glandular tumefaction.

The disease in Montana must be said to assume a remarkably mild type, and on the ranges is barely a contagious disease, and although farm animals badly affected are allowed at idle seasons to intermingle freely with range stock, yet the disease is rarely

seen among them. Perhaps it is far more common among these range, or practically wild, horses than it would seem, but remains wholly latent, or in a mild internal form, until the animal is caught and subjected to the fatigue of rough breaking, when it develops. It seems highly probable that some range horses acquire the disease in a mild form, recover and thereafter possess immunity.

Post-mortem examinations indicate less pulmonary infection than at lower altitudes.

In England the disease assumes, apparently, a more acute type than in most parts of the United States, and Prof. Williams (Prin. and Practice Vet. Med.) holds that the only practical possibility of recovery is in mild cases of farcy. Fleming (Vet. Sanitary Science and Police, Vol. I, p. 505) admits the possibility of recovery in mild cases of farcy.

In Continental Europe, it would seem, it assumes a milder type than in England. Leading professors, Dickerhoff (1), and Friedberger and Fröhner (2), and numerous others, admit the possibility of occasional recovery, spontaneously, or by the aid of medication.

War has at all times and in all countries proven a prolific cause of glanders; the fatiguing work, the great exposure, frequently in a climate wholly new to the animal, the scanty and damaged food supply, the want of proper care, the intimate, immediate contact of healthy with diseased animals, in close barracks, or at times in still closer transport ships, and the larger number of external wounds, galls and abrasions, rendering superficial inoculation easy, all serve to give the disease great virility, and cause it to spread as a serious scourge. This is not all, for, as Dr. Kilborne observes, regarding prevalence in Virginia, Maryland and elsewhere, is traceable in many of the Northern and border States directly to the purchase of affected horses from the United States Government at the close of the Civil War. The animals which had acute glanders, and would soon have died and ceased to have been a source of danger, were killed, while the dangerous animals, those with mild, chronic glanders, being impaired for military service, were sold in every direction, causing a wide dissemination of the disease.

It has been claimed that breed influences the character and distribution of glanders, but this is probably indirectly. Some say that lymphatic draft horses suffer more severely, but in central

(1) Special Pathology and Therapeutics.

(2) Special Pathology and Therapeutics.

Illinois, much devoted to breeding high class, heavy draft stock, the disease appeared far less, and of milder type, in them than in other breeds. It appeared to be especially the disease of the poor man's horse. The better classes owned the more valuable draft stock, and if one were ailing, the nature of the malady was learned by employing a veterinarian, and proper action taken, or the diseased animal was sold or bartered at a low figure to the poorer neighbor, and the disease, with the aid of unsanitary surroundings, communicated to his inferior animals.

To-day we find glanders most prevalent in those sections of our country where it runs the mildest course, shows the greatest tendency to recover, and is the least contagious. In such localities, at present, we find the most and the cheapest horses. The mild cases are difficult of diagnosis, and stock owners cannot be convinced of the character of the disease.

In the Rocky Mountain region the vast herds of wild horses cannot be satisfactorily inspected, and the mallein test in these is out of the question, so that the mildly diseased animals cannot be detected. Owners have been taught to believe that glanders is uniformly and rapidly fatal, hence take no alarm from a feeble nasal discharge, which disappears at some seasons of the year, the animal continuing in good general health and performing good labor year after year. Many owners are, in their own mind, competent judges of the matter, and relate how much they saw of it during the war, but are not aware that they only saw acute cases, and failed to note the mild cases, which, taken from the Army and sold, scattered seed, the fruit of which we are still harvesting.

Veterinarians, too, with little experience are slow to call glanders in many of these localities by its right name, but, like Dr. Klench in the paper already noted, worry themselves to find some other name by which to hide their error as to its real nature. Our British and American writers and teachers give too vivid a description of the virulence of glanders, and the average graduate locating in the dry regions of the West is illy prepared to condemn a horse for glanders, that has been barely visibly affected for seven or eight years, or one that has been ailing for a few months and is rapidly recovering.

To control glanders, we need to appeal to intelligence, where it exists, and in its absence, to force. When an intelligent horseman has been working a fat, robust, glandered horse for seven or eight years, it does not appeal to his intelligence to say to him that his animal is affected with an unavoidably and rapidly fatal disease.

I once treated a suspected animal for a few weeks, and then casually asked a competent officer to examine the horse and he unhesitatingly pronounced the horse sound, and I concurred, but the horse had glanders, and we both eventually concurred upon that point, but the owner very properly called another veterinarian, because the history of the case, and our opinions, had not appealed strongly to his intelligence.

Again I saw a pony with severe glanderous pneumonia, which an experienced veterinarian said would die in a few days, but when we forcibly killed her some months later she had largely recovered, showed little constitutional signs of the disease.

In another case a veterinary officer condemned a horse severely affected, shot it in the head at close range with a shot gun, saw it roll over and go into its death struggle, when, on account of a storm, he turned away. Later the owners helped the animal to his feet, fed him liberally, the hole in his head healed, the symptoms of glanders almost vanished, and some time later, when the horse had apparently recovered, the veterinarian found it difficult to persuade the owner that his horse was affected with a surely and rapidly fatal disease, and must be killed.

I claim that it is not appealing to intelligence to urge the destruction of glandered horses upon the ground that it is either rapidly or surely fatal, because such assertions are evidently incorrect, and horse-owners can see it as well as veterinarians. Science is truth, and the prevailing notions of the course and termination of glanders are not true, and veterinarians are largely responsible for this condition.

I have been surprised and gratified by the unanimity with which those I have asked to aid me in this paper have, when any opinion at all has been expressed, granted the possibility of recovery in cases of glanders.

In bovine pleura-pneumonia we found ample reasons for quarantine and slaughter, when only a small percentage of cases resulted fatally, and the disease was not committed to man. How much more may we urge slaughter when, eventually, nearly all cases prove fatal, and at all times the danger of human infection confronts us?

Tuberculosis is, in many respects, allied closely to glanders, and its distribution and character are modified by similar influences. In both diseases the course and duration is indefinite; the bacilli, arranging themselves in groups in various tissues and organs, become encapsuled and eventually tend to perish therein.

Both affect largely, both primarily and secondarily, the lungs, and both attack preferably the lungs of those individuals among susceptible species, other environments being equal, in which these organs are not constantly very active, but contain at some, if not at all, times a large amount of residual air. High altitudes with consequent dry atmosphere bring about special chest development, and require for the sustenance of life a much more complete and active respiration, and permit much less residual air. Post-mortem examinations of glandered horses at high altitudes, as before stated, have thus far, in my experience, indicated a much less development of pulmonary tubercles than in lower altitudes, in like severe cases. Close stabling, without exercise, produces results quite parallel to low altitudes with humidity, hence where the two are combined we would expect, and do find, the greatest prevalence and most virulent type of tuberculosis, while in the high altitudes, with dry atmosphere, it is unknown, except as directly imported.

Dr. Waugh (Allegheny, Pa.) saw tuberculosis only in sojourning human invalids in California, New Mexico, Arizona and old Mexico. The same holds true in Montana, and, so far as I can learn, throughout the Rocky Mountain region, although cattle abound everywhere, but are rarely stabled. The only case of tuberculosis reported to me as being originated in the West was one by Dr. A. H. Baker, in a Colorado bullock killed at Chicago stock yards.

As we approach the Mississippi River the disease becomes somewhat prevalent, so that Dr. W. B. Niles (Ames, Iowa) and Dr. D. A. Johnson (Sioux City, Iowa) report the disease somewhat prevalent in that State, especially in stabled herds, and Dr. S. Stewart (Kansas City, Kansas) reports whole herds of cows infected in western Nebraska, and Kansas and eastern Colorado, chiefly in the udder, without general lesions.

The infection in these cases he charged to diseased bulls brought from the East. Dr. Mayo (Manhattan, Kansas) sees the disease only in highly bred cattle, and in Arkansas Dr. Dinwiddie reports it practically unknown, except in highly bred, closely housed herds, which are rare, and in Mexico Dr. S. E. White (Sedalia, Mo) reports essentially the same condition.

Dr. LeMay (Fort Riley, Kansas) reports no tuberculosis.

Dr. J. S. Butler (Minneapolis, Minn.) reports the disease rare in that State, but observed it frequently in stabled dairy cattle in Ohio. While Dr. Howe (Dayton, Ohio) reports it comparatively rare in Ohio, confined mainly to dairy cattle.

In the Southern States cattle are, as a rule, poorly bred, rarely housed or overfed, and not generally used for dairying purposes, while generally considerable exercise is obligatory in order to obtain food, and large numbers are not brought in close contact with each other. Dr. Tait Butler (Agricultural College, Miss.), Prof. A. W. Bitting (Lake City, Florida), Dr. Cary (Auburn, Alabama), report the disease very rare in Southern States.

As we approach the central Atlantic States where many highly bred cows are kept, closely housed, highly fed, and induced to yield milk to their utmost capacity, we find the disease enormously increased in frequency and virility. Drs. Clement (Baltimore, Md.), Pearson (Philadelphia, Pa.), Kilborne (Washington, D. C.), Paige (Amherst, Mass.), and Peters (Boston, Mass.), all report the disease as highly prevalent among cattle in their regions, ascribing its great prevalence to high breeding, inbreeding, excessive lactation, excessive feeding, close housing, with other unsanitary conditions. Dr. Peters estimates that in New England 1 to 2 per cent. of cattle are tuberculous, while in Eastern Massachusetts there is probably 3 to 5 per cent. affected. Dr. Pearson notes it is increasing in Pennsylvania. Drs. Peters and Pearson note a tendency, in some cases, to recovery with the same suspicion that we all regard this tendency to recovery from glanders. They constitute the greatest danger to the health of other animals.

Dr. Schwarzkopf (Chicago, Ill.) offers some suggestions regarding tuberculosis, which deserve more than a passing notice.

Foremost in the etiology of the disease he places confinement to hot stables during the summer and winter months, which assists infection. "You know," he says, "that dairymen found out that they get more milk by keeping their cows in-doors. Experimental stations have been teaching this, and this point has been overdone. Nothing reduces more the vitality of the animal and the inherent resistance to diseases than lack of exercise. This is one of the reasons why we find so many fat cows tuberculous."

To these deductions I most heartily subscribe, and have especially noted, for a long time, the pernicious teachings of some of our experimental stations founded by our government for the purpose, among other things, of fostering our live stock and dairy interests, which, by this pernicious teaching, they are constantly tending to destroy by destroying the vigor of our cattle.

They teach that a cow yielding 20 or 30 lbs. of butter fat per week is exercised abundantly by secreting milk. These stations

are founded for scientific experimentation, but there is no science in such teaching.

We admit that in a short space of time more milk and butter fat can be taken from a cow with a given amount of food, but the process is contrary to all physiological and hygienic laws, and constitutes an enormous drain upon invaluable reserve forces which we can never replace.

Actinomycosis is rarely seen in New England and the Eastern States. Drs. Clement (Baltimore, Md.), Peters (Boston, Mass.), Paige (Amherst, Pa.), Kilborne (Washington, D. C.), Pearson (Philadelphia, Pa.), Choate (Lewiston, Me.), Howe (Dayton, O.), all report it practically unknown except by importation from the Western States.

The disease is rarely met with in the Southern States. Drs. Dinwiddie (Arkansas), Tait Butler (Mississippi), Cary (Alabama), and Prof. Bitting (Florida), having observed the disease very infrequently.

The central Mississippi valley, the West and Northwest appear to be favorite regions for the development of this disease. I have seen it assume an epizootic form in Illinois during exceptionally dry seasons, attacking sometimes 30 and 40 per cent. of a herd of 20 or 30 animals. Drs. J. S. Butler (Minneapolis, Minn.), T. J. Turner (Missouri), LeMay (Kansas), T. E. White (Missouri), G. A. Johnson (Iowa), S. Stewart (Kansas), W. B. Niles (Iowa), A. H. Baker (Nebraska), and Waugh (California, Arizona, New Mexico and old Mexico), all report it very common, and this seems the general condition all along the Rocky Mountains, and those semi-arid States sloping eastward from their base, except it seems North Dakota, in which Dr. Hinebauch reports it very rare.

In all localities there appears to be a tendency, especially in the external lymphatic type, to spontaneous recovery through suppurative destruction of the affected glands, and the iodide of potash treatment seems successful in a large percentage of cases.

It seems to be attributed, by common consent, in most cases to wounds caused by germ-infected, hard, coarse food, but this seems to account for the means of infection and geographical distribution of the germ itself, a question which at present seems unanswerable. It seems that were the germs equally distributed, sufficient coarse food would be encountered in Eastern States to frequently produce the necessary wounds for infection.

Bursattee has been so largely described as a disease of British India, and so scantily, and that chiefly in periodical literature, that

its presence is not generally looked for in this country, and far from all veterinarians have given the matter sufficient notice to recognize a case when seen, and it is feared that the reports so kindly sent me are not wholly reliable as to the geographical distribution of this malignant, infectious disease.

R. W. Burke and other East India writers describe the disease as prevailing during the rainy season, and say it abates or temporarily recovers upon cessation of latter, or upon removal of animals to dry hills. It is scarcely noted elsewhere in the old world

It is reported in the United States by Dr. Waugh in California, Arizona, New and old Mexico, by Dr. Hinebauch (frequently) in North Dakota, by Dr. W. B. Niles in Iowa, by Dr. Stewart in Nebraska and Kansas, by Dr. Mayo in Kansas, by Dr. G. A. Johnson in Iowa, by Dr. LeMay in Kansas, by Dr. J. S. Butler in Minnesota and Ohio, by Dr. C. C. Lyford in Minnesota, by Dr. Tait Butler in Mississippi, by Prof. Bitting in Florida.

It prevails extensively throughout central Illinois. I have seen it in Indiana, and it is met with occasionally in Montana. It rarely assumes a fatal type in the United States, but is persistent. It recovers spontaneously, as a rule, upon the approach of cold weather, to reappear at the same part in worse form upon the return of hot weather. While heat and moisture seem to play an essential part in its prevalence and character in India, heat seems the essential factor here, and determines its existence regardless of humidity, altitude, food, housing, care or other environments. The source of the infecting agent seems wholly unknown.

In not too severe cases it yields fairly well to treatment, when consisting of the destruction of a large part or all the germs containing tissues, followed by desiccating, antiseptic dressings.

The disease I have, for want of a better name, termed enzoötic spasm of the larynx, has been very rarely and indifferently described, and seems from all reports to be rare in the United States.

Veterinarians Joseph Leather & Sons (*) describe an outbreak of this disease under the head of lathyrns, poisoning in the horse, and attribute the disease to the feeding of lathyrns sativa, or Indian vetch. In this outbreak 21 out of 35 horses attacked were destroyed. In the same article reference is made to

* Vet. Journal, Vol. XX, p. 233.

cases of the same lathyrus poisoning occurring in the practice of Dr. McCall.

Dr. Gresswell has seen much of the disease in Colorado where the lathyrus sativa is not grown or fed.

Geo. S. Witter (*) describes the disease as it occurred in five of his breeding stallions in Colorado, but cannot suggest the cause.

Recently suit was brought in a Montana court to recover damages from the owner of an ore mill, by a horse breeder who had lost many horses from this affection, and alleged their death was due to poisons in mill tailings, which were scattered over his pastures in irrigating—quite a different cause from that suggested by the Drs. Leather.

Dr. Choate thinks it occurs rarely in Maine, although he has not seen it personally.

Dr. W. B. Niles has not seen the affection in Iowa, but has heard of an enzoötic in that State which is probably this disease.

In 1884 I observed an interesting outbreak of this disease in central Illinois, chiefly in a land of full blood and high grade French draft animals. Winter had set in early and frozen much of the green corn (maize) to such an extent that it was not worth gathering, and the animals were turned into the fields and allowed to eat the frozen ears of corn with which the advent of warmer spells of weather had putrefied.

Four or five animals in this outbreak died, while an equal number recovered. Horses kept in stable on same farm, but fed on selected maize, not frozen, remained healthy, and I was led to attribute the disease to the putrefying maize. The animals had no access to lathyrus sativa, or any bean or vetch.

The etiology of this disease seems shrouded in the deepest mystery, and there is nothing positive as to any influence exerted by climate, season, altitude, housing, etc., but probably to some unknown element occurring accidentally, but rarely and locally in food. My own cases and those of Drs. Leather and McCall suggest some form of mould, due, in my case, to frozen, putrefying maize, in the London and Edinburgh outbreaks, possibly to a mould multiplying on the vetches while somewhat damp on shipboard, but the Montana and Colorado cases tend to abrogate this idea, and rather suggest a bacterial contamination of

* American Veterinary Review Vol. XII, p. 437.

food, not due to excessive moisture and not confined to grains, since some of these cases occurred on the range, where moisture is not excessive and grains not seen.

FISTULOUS WITHERS AND POLL EVIL.

These two forms of the same disease show marked peculiarities in distribution. It occurs in every part of the United States, regardless of temperature, altitude, humidity, housing, food, breeding or other environments, but it varies greatly in its prevalence and character in different localities, and the belief of veterinarians as to etiology changes with prevalence and location.

In the States east of the Mississippi River the disease is reasonably frequent, but occurs as isolated cases, almost always traceable to traumatism, exhibiting no tendency to spontaneous recovery, but yielding somewhat tardily to surgical treatment.

In the Southern States, east of the Mississippi River, the disease is more common than in the more northerly States, and its increased frequency is variously explained. Some say it is because of the greater number of mules, which have a great tendency to annoy other animals, and especially to bite the withers roughly and persistently. Others attribute its prevalence in a great measure to the carelessness of negro owners in the matter of low stables and ill-fitting harness and saddles.

In the States west of the Mississippi River, with but few exceptions, the disease breaks out frequently in enzoötic form, and at once suggests other causes than traumatism, although these admittedly cause isolated cases here as elsewhere.

Dr. A. H. Baker, of Chicago, viewing the disease from a distance, attributes its wide prevalence in the West to bites and rough handling by other horses when in pasture. Dr. Waugh, of Pennsylvania, observing the disease in the extreme Southwest, attributes it to rolling on stones, due to the torments of insects.

But these reasons do not explain the sudden appearance of the disease in a larger per cent. of horses over a certain area, and its disappearance again in the course of a few years.

In Montana it prevails very extensively now; some cases in unbroken animals on smooth ranges devoid, practically, of serious insect pests, but it is more common in small bands of horses kept in pastures in the valleys, not worked, ridden, or stabled, and having no perceivable reason for suffering from any unusual number of traumatisms; yet it will suddenly appear in two or three, or even six or eight horses in one small band; in some as poll evil,

in others as fistulous withers, and not infrequently both appear at once in the same animal, or one may closely follow the other. Both show a marked tendency to spontaneous recovery through suppurative processes. It occurs in the stable too, as well as in the field, and I have seen poll evil and fistulous withers appear simultaneously in isolated horses, kept in good stables, with good care, and no history of wounds.

Its distribution among horses in enzoötic form, so far as we can learn, appears to coincide geographically with actinomycosis of cattle, a fact to which Dr. Reynolds has already drawn attention. A relationship has been suggested on account of their like distribution.

They bear other minor resemblances at times, and we occasionally see in poll evil, or fistulous withers, large, indurated swellings, with small, oft-recurring abscesses, pursuing a very chronic, persistent course.

In cases there appears, too, a well marked tendency to disease of osseous tissue, not typical of ordinary caries. In two cases, without symptoms of caries, I have seen in cases of poll evil anteposterior perforation of occipital protuberance, with discharge of pus from the poll evil escaping through this bony channel on the forehead. On the whole, poll evil and fistulous withers in enzoötic form, like actinomycosis, seem to be diseases of prairie localities, and do not affect timbered regions. Of all States east of the Mississippi River, Illinois, the chief prairie State, seems the only one in which the prevalence of this disease cannot be accounted for satisfactorily on the traumatism theory. Dr. T. S. Butler, of Minneapolis, draws attention to a notable fact, in that in his region, as in the case in Illinois, the disease is rare in cities in comparison to the number of cases occurring on farms. Were traumatisms the sole cause such should not be the case.

Periodic or specific ophthalmia offers some very interesting facts in its geographical distribution. It seems common in the British Islands and Continental Europe, although not so prevalent as in parts of the United States. In our country the disease occurs frequently in the New England and Atlantic States, due largely to importation from the Mississippi Valley. It appears to arise frequently in the Allegheny Mountains, and is reported common in Maine by Dr. Choate, and in Massachusetts by Dr. Paige.

Along the coast it seems to disappear almost wholly, except as an imported disease, so Drs. Pearson, Peters, Kilborne, and

others report it very rare, although other practitioners report a more frequent occurrence.

In Alabama, Dr. Cary reports the affection frequent and acute, but in general the disease seems not very common in the South.

The disease occurs most frequently in the States bordering upon the Ohio River, and upon the Mississippi River above its junction with the Ohio, reaching its greatest prevalence in the United States, and probably in the world, in Illinois, Iowa, and Missouri. In more northerly States it tends to disappear, so that Dr. Lyford, of Minneapolis, sees it largely in imported horses.

As the high, semi-arid country east of the Rocky Mountains is, approached the disease becomes far more rare, and less dangerous, yielding readily, in most cases, to care and treatment. So in Nebraska and North Dakota, Drs. Stewart and Hinebauch report it very rare and mild.

Reaching a still greater altitude, with less rainfall and humidity, the disease vanishes as we approach the Rocky Mountains, to reappear again at a few of the lower altitudes along the Pacific Coast.

This disease has no parallel in geographical distribution. It vanishes wholly in those regions where tuberculosis and tetanus cease to exist, but prevails to its greatest extent in regions where the latter are comparatively rare, and in turn becomes rare where tuberculosis and tetanus prevail most frequently and severely.

The etiology has been explained by some teachers and writers, apparently to their entire satisfaction. I was taught that it was largely hereditary, and that the shining example of this was to be found in the progeny of the famous blind sire, Lexington, and so in my early practice I frequently found the cause in a remote infusion of Lexington blood, attributing to other causes the more frequent appearance of the disease in draft stock not related to Lexington. In the Rocky Mountain region we find as much of the Lexington blood, comparatively, as anywhere, the original breeding stock having been derived very largely from Kentucky, and bands of thoroughbreds are found, almost every animal of which may be traced back to the illustrious blind horse, yet I have not seen a horse in the Rocky Mountains affected with periodic ophthalmia, except newly imported animals, and these recover promptly unless very far advanced, and remain permanently free from the disease. My observations in this region have been very

brief and limited, but are in full accord with the more extensive experience of Drs. Knowles (Montana), Waugh (California, Arizona, New Mexico, and old Mexico), Turner (Fort Niobrara, Nebraska), and other veterinarians and stock owners of this region. In fact I have been unable to learn of a single case of this disease arising in the entire Rocky Mountain region, whereas, were heredity a sufficient factor in the causation of the disease, the entire region, where carelessness in breeding reaches its highest point, should be thoroughly overrun with this affection.

Inbreeding is mentioned too as a fertile cause, yet in the large bands of wild horses in this region, colts grow up, are left uncastrated, and mate promiscuously with parent or offspring without producing evil results in this respect.

Close, ill-ventilated stables, especially dark stables, are also cited as fruitful causes, but in the northern Rocky Mountains, where low temperature prevails, stables are very dark and unsanitary, yet the few horses kept in them are free from the disease.

Others attribute the disease to the ill effects of bright sunlight, especially to snow glare in the winter season, but this disease is more of a summer affection, and does not occur so largely in winter in any district, so far as observed, and were snow glare an important factor, the Rocky Mountains should be the chief habitude of this disease, since the snow glare of this region is far beyond that of the States where the disease prevails.

No one living in the Mississippi Valley, or eastward, can begin to appreciate the intensity of the snow glare, as seen at high altitude in the Rocky Mountains, with its dry, calm atmosphere, and excessively low temperature during winter.

Others attribute the disease to food, and since the disease reaches its highest prevalence in the chief corn producing States, maize is held largely responsible for its prevalence. There is good reason for believing this food to be an important factor in its cause, but not in itself sufficient to bring it about, or at least it falls far short of being a chief or essential cause.

The disease is not uncommon in many regions in this country where corn is rarely fed, and appears frequently in England and Continental Europe where corn is not fed at all.

Neither is corn fed along the Pacific Coast where the disease prevails. It is hard to determine, under these conditions, if food can ever suffice to produce the disease, or if the great prevalence of the disease in the chief maize territory is a mere coincidence.

That temperature, and more especially altitude and humidity, exert a powerful influence upon the occurrence of this disease there can be no doubt.

Dr. Clement (Baltimore, Md.) suggests yet another element in the causation of this disease, worthy of careful consideration, and in order that I may give you his views clearly I quote his words: "There is an affection, from casual observation, identical with specific ophthalmia, but which is infectious beyond doubt, and which attacks horses without history of what we call specific ophthalmia, sudden attack of conjunctivitis, followed in a few hours with acute iritis and pus in the anterior chamber. Disease amenable to treatment by rest, counter-irritation and atropia injections. If not attended to apt to be followed by adhesion of iris to lens, and sometimes cataract. Either this is different from specific ophthalmia, or we are all wrong in description of latter disease. I am inclined to latter belief."

Dr. T. J. Turner (Columbia, Mo.) gives a description of the disease essentially identical with that quoted from Dr. Clement, and I have noted in severe cases in Illinois the same symptoms, course and termination. I would add also, that on several occasions on farms where the disease had not before occurred, and in families where prior history had been wholly clean in respect to this disease, and where the most careful examination failed to discover any cause in, or even change of food, housing, or care, in any way whatever, that the disease would suddenly appear in several animals in a very virulent form, running an exceedingly acute course, terminating frequently in blindness at the first attack. In this way I have seen four or five animals, out of a band of seven or eight horses on one farm, all previously sound and without hereditary taint, suddenly attacked with virulent ophthalmia, ending in permanent blindness, the disease then vanishing, leaving the sound animals perfectly well. In these cases all parts of the eye appear inflamed, tense and painful, the conjunctivæ hyperaemic, the cornea opaque, and the anterior chamber filled with lymph, pus or blood. Dr. Clement's suggestion of infection in these cases is certainly worthy of careful consideration, as it may possibly explain them, which cannot be satisfactorily done by the theories advanced heretofore.

To say the least our accepted ideas, as to the etiology of periodic ophthalmia, need revision.

HOW CAN WE CONTROL THE PREVALENCE OF TUBERCULOSIS AMONG CATTLE?*

BY M. R. TRUMBOWER, D. V. S.

Addressing you as a representative of a great Western State, one noted for its dairy and breeding interests, and in which no action has yet been taken concerning the control of this disease, I may appear as an obstructionist, rather than an active sanitarian, to those of you who have studied this subject longer than I have, and who have been engaged in practical work for its control.

The fatality among cattle from this disease is not so great as to create a general demand for legal measures to protect breeders and dairymen against losses. The demand is made as a public health measure.

In whatever I may say to you here to-day, I do not wish to be understood that I am opposed to destroying the tuberculous cattle wherever they may be found, but I do believe that the danger to human life, by eating the meat or drinking the milk from tuberculous cattle, is very greatly exaggerated by many of our medical brethren.

In the consideration of this subject we must lay sentiment aside, attractive as it may seem, and study it so that we may arrive at conclusions that are practical and capable of being carried into effect, without becoming abortive in our hands.

While I appreciate the need of aggressive work, I feel that we of the Western States are far from being ready or able to enforce any specially restrictive measures at the present time. Our people are not educated in this matter. Some of our farm journals are publishing reports of the work done by a few of the Eastern States, with comments upon it that are very unfavorable, and, instead of being an aid, are detrimental to correct information.

Our dairymen are suspicious of imposition, and jealous of their rights, and, if we attempt at the present time to enforce active measures, involving the business of the dairymen in the destruction of a part of their herds, before they become aware of the justice of such proceedings, we will succeed only in making a miserable

*Read at a meeting of the United States Veterinary Medical Association, held in Philadelphia, Pa., September 18th-20th, 1894.

failure, and endanger all practical efforts for the next generation.

Even most of our physicians and public health officials are not sufficiently well informed to endorse the actions that will be necessary to secure effective results.

In the medical profession this matter of sanitary protection against tuberculosis infection is in its infancy; by many of them the dangers are depicted in a horrifying manner, and by others they are almost entirely ignored.

Until the medical profession obtains some recognition in its endeavor to protect human life, what have we to hope for? In their efforts, human lives are at stake alone, regardless of financial values. In our efforts, financial values are predominant in the minds of those directly and primarily affected.

Our dairy interests are very great. The dairy products of Illinois in 1892 amounted to the value of \$75,691,765; in 1893, \$90,000,000 in round numbers. Before we antagonize this great industry in any way that may seem arbitrary, we should count the cost. Invested capital recognizes no sentiment, nor will it tolerate any apparent infringement upon its rights.

While this agitation regarding the prevalence of tuberculosis among cattle is a legitimate and proper one, we should be guarded in our assertions, and confine ourselves to statements of fact. Some there are who dwell upon the great danger resulting to the human family from the consumption of meat and milk, a danger that has been exaggerated out of all proportion, and, if continued, will result in the closing of all foreign markets against the beef and dairy products of this country, for it will lead foreign nations to believe that all our herds are largely tuberculous. We ought to be just toward ourselves, and avoid magnifying a fact that is sufficiently serious to be worthy of our attention when viewed in the light of truth.

Why lay so much blame upon milk from cows, by the wild presumption that many thousand infants die annually from intestinal tuberculosis, the result of milk infection, when it is acknowledged that seven per cent. of the human family is consumptive?

Does it appear right?

How many cases are recorded when cows' milk was the known cause of such fatality? Very few.

Does it not appear to you that we are attempting to make a scapegoat of the useful and almost innocent cow? Again I say, we are not yet ready in the West to adopt radical measures for the

suppression of a disease that does not prevail to any alarming extent among our herd.

I am well satisfied that we in Illinois do not have the percentage of tuberculous animals that you have in Massachusetts, or any other of the Eastern States. Our cattle are kept under different, better, and more natural conditions. Their lives are more active, they are not so closely housed, there is far less exposure to contamination, and, above all, are not inbred as much as many dairy herds of the older States. The farmer does not keep the same family of cows on his farm for several successive generations, and then distribute them among his children as part of their birth-right.

The majority of our cows are used only one or two years in the dairy, and then they are fattened for beef, while yet young, and desirable beef cattle. The most of our beef cattle are sold and slaughtered before they have gained maturity; hence we rarely find any evidence of tuberculosis among them. Therefore, I believe, we have a great deal less of this disease than is found in the older States.

If we undertake the eradication of tuberculosis from our breeding and dairy herds, we assume an endless task. When we destroy one per cent. or forty per cent. of our dairy cattle, they will have to be replaced by an equal number, which, in turn, may be infected with tuberculosis. We will have to destroy or abandon many cattle barns, such as cannot be thoroughly disinfected.

Consumptive attendants may be a source of infection of our herds. The presence of tuberculosis in swine, and other domestic animals, is not a source of danger.

I see only one way by which we of the West can make any progress towards lessening the prevalence of this malady, and that is, to provide by special enactment laws for the inspection of all cattle that are used for supplying milk to cities, towns and villages. This would require inspectors for each district, who should be appointed by some central power, and no one should be allowed to sell milk coming from uncertified cattle. This action necessarily invokes a large appropriation for compensation of inspectors, and other clerical aid. So long as any community is opposed to such enactment, its representatives in the legislative body will not vote for it. A rural representative will not misrepresent his constituency in such a measure.

Cities, by ordinances, may require milk inspection, but that does not reach far enough; dairy inspection they cannot enforce,

for most of the dairy herds are owned outside of their jurisdiction.

If the State provides for dairy inspection at public expense, all cities, towns and villages are equally entitled to the benefits. Then, where will we find a sufficient number of competent, faithful, and honest men to fill this requirement? We do not have a sufficient number of veterinarians in the State of Illinois to do this work if all were engaged in it, nor is there a single State that has, with the exception of a few of the New England States.

I have an impression that we of the West can obtain the best results for the present time by using all our energies in disseminating reliable information, and thereby arouse public sentiment that will eventually lead to the desired end. Patience, and persistent effort, judiciously administered, will do more good now than more active measures that would be in great danger of being regarded as arbitrary and unjustifiable by our people.

In the meantime, we in the State of Illinois shall make inspections, as heretofore, of herds that are reported to be tuberculous by their owners, and earnestly advise the prohibition of the sale of milk from such herds, until the affected animals have been killed.

By the terms of the law under which our State Board of Live Stock Commissioners act, they can only cause to be investigated reported existence of disease, hence a thorough search for diseased animals cannot be inaugurated except in tracing out exposures to any reported case.

Again, the peculiar wording of the law regarding compensation to owners of diseased animals is such that no compensation can be made in cases of tuberculosis, since in appraising cattle the amount of appraisement is based upon the fair cash market value for use for beef or for dairy purposes. Such being the situation, the only course left for the Board to pursue upon the discovery of this disease, is to place the diseased animals under quarantine, until the owner agrees to destroy them.

We dare not advocate radical measures just now, and I do not consider it is so urgent and vital a necessity as some of our theorists do.

Now, a word in regard to the tuberculin test. Are we justified in condemning as unfit for human food every carcass that has reacted to this test? If so, do we not destroy a great deal of valuable and productive property needlessly?

I do not believe that the milk or flesh is dangerously infected in an animal that has only a small deposit in the mediastinal gland, or an encysted abscess in the liver; but how can we determine this.

during the lifetime of the animal? We cannot do so, therefore we have to destroy all that react, or else only those which manifest some physical evidence of the disease on examination. Would not the latter method be practically sufficient and exceedingly more satisfactory to the owner than the former?

Re-examinations would have to be made oftener, but we would avoid the antagonism and enmity of the owner, which would eventually lead to submission on his part to any measure we might subsequently advocate.

If it is advisable to destroy all cattle that react to the tuberculin test, the United States Government will have to take charge of this work in all the States that give their consent to it, and all cattle from other States must be strictly excluded, unless they have undergone the test, and are declared free from the disease. This would virtually establish a dead line between States, and would soon become so irksome as to cause organized opposition and greatly delay, if not prove detrimental to all concerned.

Before leaving this subject, I wish to call your attention to a marked element of danger in the diagnosis of tuberculosis post-mortem.

Many of you doubtless know that aged cows which have been badly kept and whose vital powers are on the decline, very frequently have glandular indurations, caseation, and occasionally calcification may be present, without being tubercular in their nature. Again, we occasionally find actinomycotic growths in the lungs and other organs which simulate in appearance tuberculosis so closely that it becomes very difficult to distinguish the difference. Possibly there are veterinarians who might inadvertently swell the percentage of tuberculosis by mistaking such cases for that disease.

I will now leave this subject with you for your consideration, and if I have succeeded in provoking a discussion upon this difficult problem, "How to Suppress Tuberculosis," I shall feel myself amply rewarded for presenting the practical part of this question in my own way.

DISEASES OF THE LIVER AS A DIRECT CAUSE OF INTESTINAL DISTURBANCES*

BY DR. D. F. FOX.

This is a subject, gentlemen, which I have paid particular attention to in the last couple of years, and, owing to its insidious and complex nature, and it being a subject which is so difficult to ameliorate, and which, in my experience, does not readily yield to treatment, I naturally feel very anxious and ambitious to learn, from the exchange of ideas of those present here to-night, more about the pathology and treatment of intestinal disturbances. With this end in view, I have attempted to advance a few ideas, in which I hope to show that the majority of intestinal diseases are due to hepatic disturbance.

In order, therefore, to approach this subject in a comprehensive manner, we will first take up the consideration of the liver and its physiological properties.

As you all are aware, the liver being the largest as well as one of the most complex and important glands in the animal economy, and as it has some very essential and rather complex functions to perform, it is very easy to understand how any deviation from its normal condition will cause derangements of the alimentary tract.

The most important, and one of the chief, functions the liver has to perform, is the secretion of bile, the only one which directly pertains to the subject under consideration. There are, however, other functions, notably the one that controls the effect upon the blood during its transit through the hepatic circulation, whereby the blood is fitted for its subsequent purposes in the animal economy.

The secretion of bile is continually going on, but it appears to be greatly retarded during the period of fasting, and accelerated on the prehension of food, as has been shown by different experiments made by establishing a fistulous opening on the outside; it was noticed that during the period of fasting there was scarcely any bile discharged, but upon partaking of food an abundance of bile was discharged in a very few minutes.

The purpose served by the secretion of bile may be said to be

*Read before the California State Veterinary Medical Association.

of two principal kinds: excrementitious and digestive. From the peculiar manner in which the liver is supplied with much of the blood that flows through it, it is possible that this organ is excretory, not only for such hydro-carbonaceous matters as may need expulsion from any portion of the blood, but that it serves for the direct purification of the stream which, arriving by the portal vein, has gathered up various substances which may need to be expelled almost immediately after their absorption, for it is easily conceivable that many things may be taken up during digestion which are not only unfit for the purpose of nutrition, but which would be positively injurious if allowed to mingle with the general mass of blood.

The liver, therefore, may be supposed, placed in the only road by which such matters can pass unchanged into the general current, to jealously guard against further progress of effete matters, and turn them back again into an excretory channel.

One chief function of the secretion of bile is purification of the blood, by ultimate excretion of effete matter, yet there are many reasons for believing that it is in the intestines where it performs its most important function in the process of digestion. In nearly all animals the bile is discharged, not through an excretory duct communicating with the external surface, nor with a simple reservoir, as most secretions, but it is made to pass direct into the intestinal canal, where it mingles with the chyme directly after it leaves the stomach, an arrangement the constancy of which clearly indicates that the bile has some important relations with the food with which it is thus mixed. A similar indication of its digestive properties is furnished by the fact that the secretion of bile is most active, and the quantity discharged into the intestines much greater, during digestion than at any other time, although this activity may in part be due to the fact that a greater quantity of blood is sent to the liver through the portal vein at this time, and that this blood contains some of the materials of the food absorbed from the stomach and intestines which may need be excreted, either temporarily, to be afterwards reabsorbed, or permanently.

Bile is a somewhat viscid fluid, of a yellow or greenish color; it has a strong, bitter taste, and when fresh has scarcely any perceptible odor; it has a neutral and slightly alkaline reaction; its color and degree of consistency vary considerably, apparently independent of pathological changes in the liver. The saline, or inorganic, constituents of the bile are similar to those found in

most of the other secreted fluids; the neutral phosphates, carbonates of sodium and potassium do not exist in the fluid state, but are formed during the act of incineration, and are found in the ashes. Oxide of iron is also said to be a common constituent of the ashes of bile; copper is usually found in healthy bile, and continually in biliary calculi.

Regarding the functions discharged by the bile in digestion, it may be said that it assists in emulcifying the fatty portions of the food, and thus rendering it capable of being absorbed by the lacteals. It has considerable antiseptic properties, and may prevent decomposition, putrefaction and fermentation of food during its passage through the intestines. It also acts as a natural laxative by promoting an increased secretion of the intestinal glands, and by stimulating the peristaltic action of the bowels, thereby assisting them in the propulsion of their contents.

Let us now for a moment consider in what manner we can arrive at a conclusion as to how we can account for the fact that intestinal disturbances are the result of morphological changes in the hepatic gland. As we have already stated, the liver is a very large organ, and has some very important functions to perform, of which, perhaps, the most important is the secretion of bile; bile, therefore, being a very essential substance in the process of digestion, it is perfectly plausible that an insufficiency or a preponderance of this important fluid will, and does, at once lead to intestinal derangements.

Being fully cognizant of the fact that one of the chief functions of bile is to act as an antiseptic, by preventing the food with which it comes in contact from undergoing the processes of decomposition and fermentation, we can readily see that an insufficiency of this very important material will allow the ingesta, or contents, of the intestines to become septic, putrid or fermentitious, a condition which is frequently demonstrated by the fetid aroma which always attends the fæcal matter of these cases. Again, bile being a natural carminative, an insufficiency of it will frequently be shown in the so-called cases of flatulent colic, which formerly were supposed to be due simply to fermentation of the food. Bile also acts as a natural purgative, by increasing the secretion of the intestinal glands; therefore, if the supply is curtailed, we are pretty sure to have indigestion, constipation, etc., follow as a sequel. If, however, the supply is increased beyond normal, we have as a sequel, diarrhœa, and I might state in this connection that it is my opinion that a great many cases of chronic diarrhœa are caused

by a preponderance of bile being thrown into the intestines, a condition which is due to an over-active liver. Bile, acting as a local irritant, stimulates peristaltic action of the bowels, and increases their vermicular motion, thereby propelling or forcing the food through their channel; knowing this fact, we can readily see why a lack of this natural irritant which produces peristalsis will be followed by torpidity, paralysis, impaction, inflammation and gangrene of the intestines.

While it is possible to attribute, and perhaps trace, all lesions of the intestinal tract to be due to a morbid liver, yet I do not wish you to think that I advocate this idea, for I am fully aware of the fact that there may be, and are, numerous diseases of the intestines which have no connection with, and are independent of, any pathological changes in the liver, but as there are so many intestinal disorders which are liable to follow hepatic disturbances, I would suggest that a very rigid examination of the liver be made when called upon to administer to any animal affected with any disease of the visceral organs.

In establishing proof of, or in substantiating, the above statements, I will, with your kind permission, describe one of these particular cases, which, in my estimation, have their origin in the hepatic gland; for instance, you are called to see a case, which, on your first examination, will be lying down in the recumbent position, or standing in the corner of the stall, comparatively speaking, quiet, but upon closer examination you will notice that from time to time he will look around at his flank, or elevate the head and turn up the upper lip. If we now, supposing the animal to be lying down, make him get up, he will walk around the stall a few times, and will apparently make at intervals attempts to urinate, or to lie down again; finally, if he does not lie down, he will go into one corner of the stall, and stand there for some time in an attitude apparently of repose. Upon inquiring into the history of the case, you will be told that the animal, for the last two or three days, has had no appetite, either for solid or liquid matter. Upon still closer examination you will find the pulse running from 40 to 60, temperature 101 to 102; the conjunctiva will be of a dirty, reddish-yellow color. If you now manipulate the mouth, you will find that the tongue and mouth have a furred and soapy feeling, and the breath has a sour, fetid odor; upon auscultation of the flank, you will notice an absence of borborygmous sounds, that clearly indicate that there is an absence of peristaltic action of the bowels; upon percussion over the region of the liver on the

right side, the animal usually evinces pain. The fæcal matter passed is dry, hard, and thickly covered with mucus, and is passed in small quantities; in some cases the sphincter anni has lost its contractibility, which leaves a permanent dilation of the rectum. If no relief is given, the animal will usually linger on in this condition, apparently with no perceptible change, for from eight to twelve days, when you will notice a change for the worse, when enteritis sets in, and the animal quickly succumbs to its baneful effects. If properly treated, however, a successful issue may be looked for in from three to five days.

Now, gentlemen, believing that all of you have, from time to time, been called to prescribe for like cases, when you felt, as I have done on numerous occasions, that you were, if you will permit me to use a hackneyed expression, "at sea" regarding the particular lesions you are to prescribe for, having this circumstance in mind, I concluded by presenting this matter before this honorable body, through whose experience and exchange of ideas I can reach a conclusion as to what manner I can therapeutically prescribe for these cases, so I can endeavor to remove the cause, and not, as I believe I have been doing heretofore, endeavoring to remove the effect.

SACRAMENTO, CAL.

PENNSYLVANIA.

AN ACT

TO ESTABLISH A LIVE-STOCK COMMISSION, TO REGULATE THE
ERADICATION AND SPREAD OF CONTAGIOUS DISEASES,
AND TO SECURE DAIRY INSPECTION.

SECTION 1. Be it enacted by the Senate and House of Representatives, etc.: That a Commission, known as the Live-stock Commission, be, and hereby is, established. Said Commission shall be composed of five members: three veterinarians, who shall be of good standing in their profession, graduates from a recognized veterinary college, and selected from among the list of members of the Pennsylvania State Veterinary Medical Association, the President of the State Board of Health, and a member of the State Board of Agriculture. They shall be appointed by the Governor of this Commonwealth, and shall serve continuously for a period of three years, or until their successors are appointed and

duly qualified. Said Commissioners shall have power to make rules and regulations to execute the provisions of this Act, providing such rules and regulations do not conflict with the rules and regulations of this State or of the United States.

SECTION 2. Said Commission shall respectively take an oath of office to perform the duties of their office faithfully, shall immediately organize by electing one of their members as President, and shall forthwith proceed with the discharge of their duties as provided for in this Act. Their salary shall be fixed by the Governor.

SECTION 3. The Governor shall have power to revoke the appointment of one or more of the appointees for incompetency or continued neglect of duties. Vacancies accruing from this or for any other cause shall be refilled by the Governor as herein provided for.

SECTION 4. Said Commission shall maintain an office and hold meetings at the call of the President or of his two colleagues at such times and places as is most convenient for the performance of their duties.

A detailed record of all transactions and of all animals examined or destroyed shall be kept in said office for future reference.

SECTION 5. It shall be the duty of the said Commissioners to cause investigation to be made as to the existence of all contagious and infectious diseases, especially of tuberculosis, and such Commissioners, or their duly constituted deputies or agents, are hereby authorized to enter any premises or places, including dairies, slaughter-houses, stockyards, vessels, etc., within any port or county in this State in or at which they have reason to believe any such disease or diseases exist, and to make search, investigation and inquiry in regard to the existence thereof; also are they hereby authorized and required to establish and maintain such quarantine of animals, places, dairies or localities as they may deem necessary to prevent the spread and transmission of such disease. They are also invested with power to destroy and dispose of such diseased animals as herein provided for.

SECTION 6. Said Commission shall also be authorized, at the request of the State Board of Health, a local Board of Health where such exists, and in all cities, towns and boroughs where no such local Board exists, then at the request of the Mayor, the Burgess or Burgesses, to appoint a local deputy, or more than one if necessary, who shall be called Dairy Inspectors, whose salary shall be fixed by such city, town or borough wherein the appoint-

ment is made. Such Inspectors, whose work shall be assisted by a local Board or by the State Board of Health, shall be under the authority, control and direction of the Live-stock Commission, whose duty it shall be to prepare, print and distribute to all producers and venders of milk, and to all Dairy Inspectors, general circulars for the uniform direction, guidance and control of the said Inspectors of dairies and their assistants.

SECTION 7. The Dairy Inspector and his assistants of any city, town or borough, in order to carry out the purposes of this Act, shall have the right at any and all times to enter upon or into the premises of any producer of milk. They shall carefully inspect, inquire into and report to the said Commission without delay upon all matters and things which they are directed and required by the said Commission to inquire into and report upon. And they shall from time to time examine all milch cattle of said milk producer for the discovery of tuberculosis or other infectious diseases among the same, using the manner and means of examination prescribed by the said Commission.

SECTION 8. Whenever any animal in a herd of milch cows or any other animal or aggregation of animals in any locality or place whatsoever examined under authority aforesaid by the said Commission, their deputies or Dairy Inspector or Inspectors, is by him or them discovered to be the subject of an infectious or contagious disease in any degree, the said animal shall be immediately branded or securely tagged and safely separated and kept apart from the rest of the herd; and it shall be unlawful for the carcass, the milk or flesh of said diseased animal to be sold, offered or exposed for sale, delivered or received, or purchased for sale by any person or persons whomsoever with the intent, purpose or probability that it may be the means of spreading such disease or become the food of man or domestic animal. Any violation of this section or any of them shall be punished by a fine of not less than two hundred dollars (\$200), nor more than five hundred dollars (\$500), together with imprisonment of not less than four months or more than one year.

SECTION 9. The sum of fifty thousand dollars (\$50,000) is hereby appropriated for the purpose of providing and defraying the expense of carrying out the requirements of this Act, to wit: So long as there is any money in the State Treasury available for the purpose, whenever any animal is found by the said Commission, their deputies or Dairy Inspector to be the victim of tuberculosis or other contagious disease in any degree, in addition to the

requirements of Section 8, a jury of three reputable citizens, well versed in the value of cattle, shall be appointed without delay, one of whom may be appointed by the said owner, but if he neglect or refuse to exercise his right, then by the Commission or said Dairy Inspector, where such exists; one by the said Commission or Dairy Inspector, where such exists, and one to be chosen by the other two; and the said jury, after having been sworn (and the Inspector or member of the Commission or his deputy is hereby authorized to administer oaths for this purpose), shall impartially appraise the actual cash value, in its diseased condition, of the said animal; and the surroundings of the herd shall be given due consideration in said valuation, and no animal shall be assessed, for the purpose of this Act, at a higher sum than forty dollars (\$40).

The said Commission or Inspector shall thereupon cause the said animal discovered to be the victim of tuberculosis or other infectious or contagious disease to be immediately slaughtered and speedily disposed of, according to the directions of the said Commission, in such a manner that no part of the carcass be consumed, or be liable to be consumed, as food for man or domestic animal. If the autopsy show that the said animal was the victim of tuberculosis, or of any other highly dangerous, contagious or infectious disease, in that case the owner of said slaughtered animal shall be paid out of the said fifty thousand dollars (\$50,000) a sum equal to one-third the said assessed value. If, however, the autopsy of the slaughtered animal reveal the presence of no infectious or other disease, dangerous or harmful to health through consumption of the flesh or milk thereof, then and in that case the owner of the said slaughtered animal shall be paid out of the said fund of fifty thousand dollars (\$50,000) an amount equal to the said assessed value of said animal; or, in lieu thereof, at the option of the owner, the carcass shall be turned over to the said owner, to be disposed of by him as beef or otherwise.

SECTION 10 It shall be unlawful for any person to interfere with any Commission, Inspector, deputy or assistant herein provided for in the performance of his duties under this Act. A violation of the provisions of this section shall be punished in the name provided for in Section 8 of this Act.

SECTION 11. This Act shall go into effect on the first day of June, 1895, and all Acts or provisions of Acts inconsistent herewith are hereby repealed.

THE ADVANTAGES OF THE POINT SYSTEM OF JUDGING, AND HOW IT SHOULD BE INITIATED.*

At a conference of delegates from Agricultural Societies, convened by the Department of Agriculture of New South Wales, it was pointed out that the aim and objects of the Agricultural Societies in that colony were to a large extent frustrated, and that a great part of the expenditure at many of the shows did not bring about any good to the agricultural community, owing to the following causes:—That the neighbouring Societies frequently clash in the date of holding their shows, instead of co-operating in this as well as in other matters of mutual importance; that prizes are given by Societies (1) for products and varieties of grain, &c., which are unsuitable for cultivation in their districts or for commercial purposes; (2) for breeds of fowls, &c., valuable for fancy purposes only; (3) for objects not connected with agriculture; (4) for exhibits of produce, especially grain, without making it compulsory for the successful competitor to show, if required, that his exhibit is a fair specimen of what has been produced by him on a commercial scale.

It was, however, agreed that the greatest difficulty with which the Societies had to contend was the lack of competent judges and the defective system of judging at present prevailing.

It was suggested as a remedy for this difficulty that a system of judging by points should be introduced which would render it unnecessary to employ more than one judge in any section, and the judge need not be a stranger to the district, a condition which had hitherto been generally adopted unless, as frequently happened, a lack of judges compelled the committee to request local men to act in that capacity.

Mr. Alexander Bruce, Chief Inspector of Stock, was accordingly requested to frame a system for judging animals by points, giving the relative value which should be attached to each point of the various animals usually exhibited at shows.

As the same difficulty besets Agricultural Societies in this country, Mr. Bruce's report is worthy of careful consideration. As, however, space does not permit of the whole of the report being inserted, we will confine ourselves to the system as regards sheep,

* *The Agricultural Journal*, Cape Town, Cape of Good Hope, Africa.

the want of competent judges in that class being most keenly felt throughout this Colony.

In submitting his report, Mr. Bruce mentions that although the points have been to some extent tested, and would, he is confident, produce more satisfactory decisions than are now as a rule given under the present system of judging, it is not to be expected that they are yet perfectly correct. Such a result can only be arrived at by practice and experience; but it is considered that the system will be found sufficiently accurate for all practical purposes.

The following explanation will enable the reader to more fully understand the system and the basis on which the values attached to the various points have been calculated.

PEDIGREE.

Combined with good shapes and a sound constitution and frame, a good pedigree is one of the most valuable points in stock, insuring as it does in a very high degree, when possessed by both sire and dam, success in breeding; for then, and then only, does the saying that "like begets like" hold good.

The marks for pedigree would be fairly awarded on some such basis as the following:—

(1) For stock which are not admissible in the stud or herd books of the respective breeds—no marks.

(2) For those just admissible—say 5 marks.

(3) For those having a better pedigree than those just admissible, any number of marks above 5 and not exceeding 20, according to the length of the pedigree and purity of the strains from which they are descended.

OFFSPRING.

In order to render an animal eligible for marks under the head of "offspring," the exhibitor should produce documentary evidence that the progeny of the animal had obtained at some Agricultural Societies' Shows, either say—

2 first prizes, or

3 first and second prizes, or

4 second prizes.

And if they had been successful in any of these cases, the 5 marks should be allowed. While if the animal's progeny showed a better record, the marks allotted might be increased to any number above 10 and not exceeding 20, according to the number of the prizes, and the standing of the shows and classes in which the prizes were won.

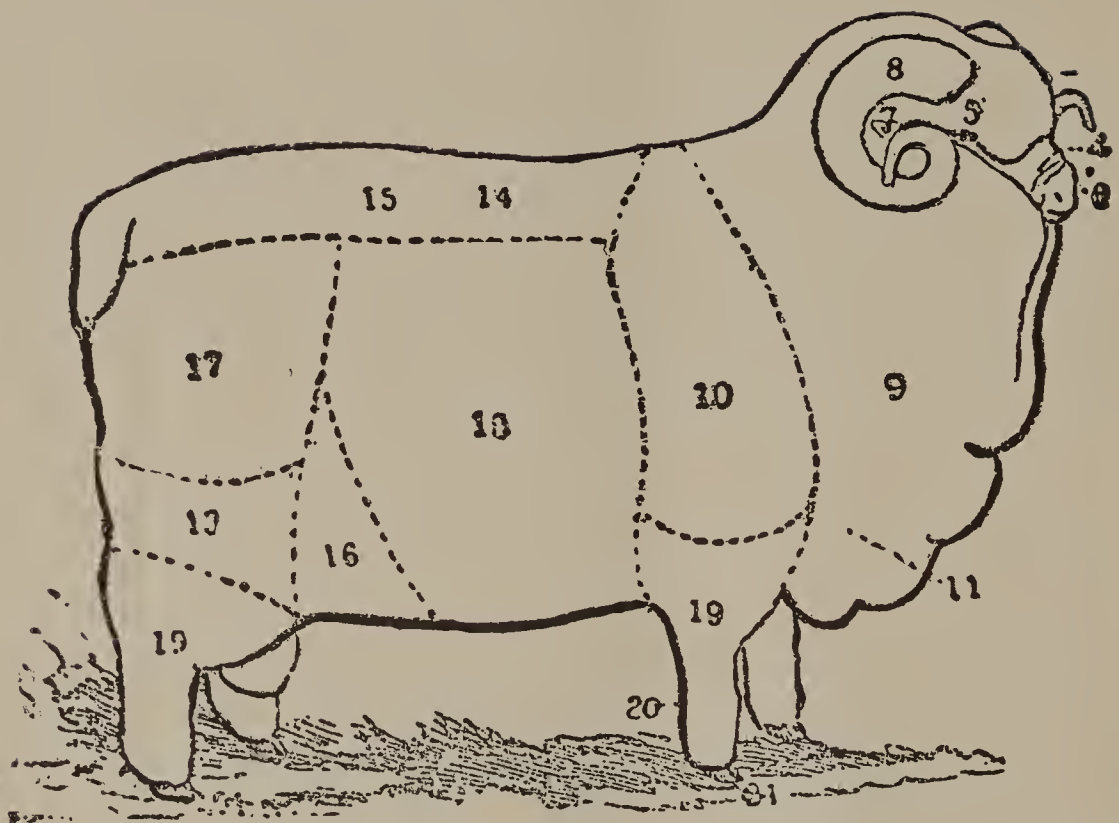


FIG. 1.

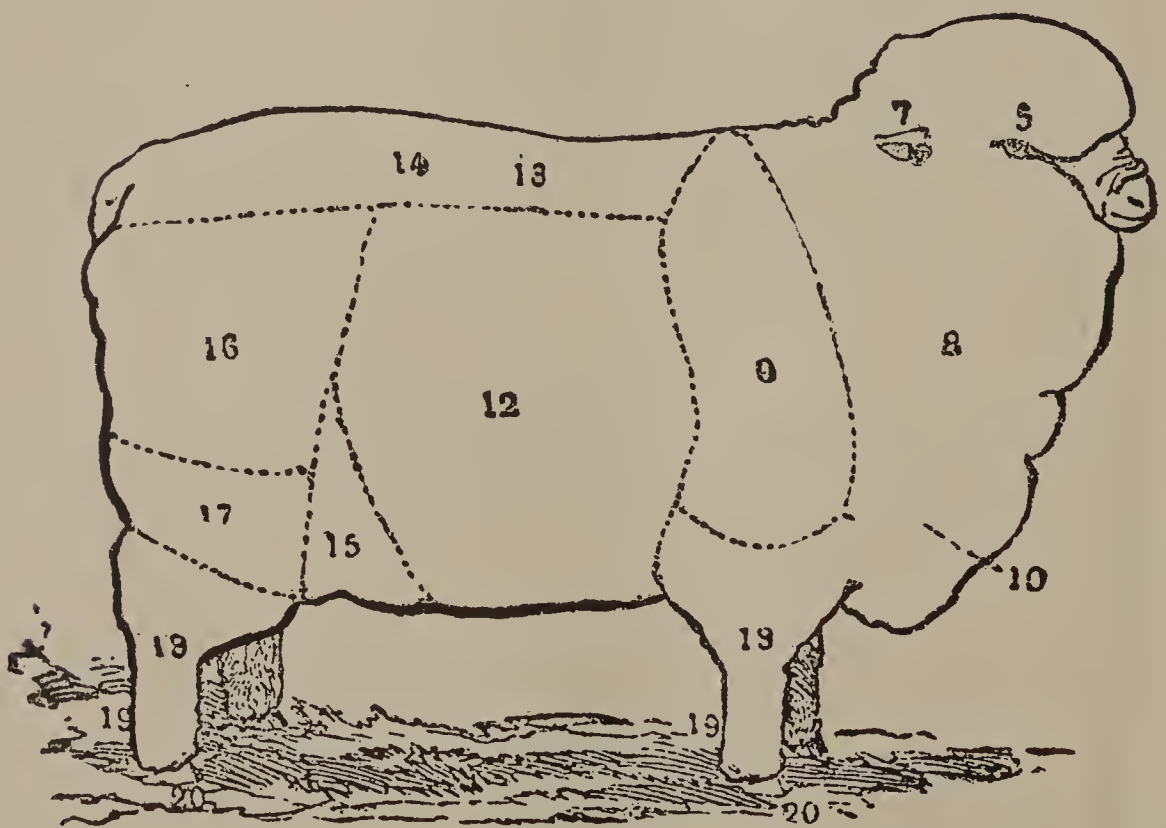


FIG. 2.

Description of Points and their Values of Medium Combing Ram.	Single Points. Aggre- gate 250.	Groups. Aggre- gate 100.	Divisions. Aggre- gate 100.
I. BREEDING AND QUALITY.			
1. <i>Pedigree and Offspring.</i>			
1. "Pedigree."—According to standing in Stud Book, or as proved by certificates and declarations.....	20	16	
2. "Offspring."—To be viewed from the character of the offspring as shown by their success at Shows.....	20		
2. <i>General Appearance, Style and Character.</i>			
3. "Symmetrical form and proper complexion and covering."	10	4	
3. <i>Head.</i>			
4. "Countenance."—The forehead should be broad and the countenance healthful.....	5	8	28
5. "The Eyes."—Should be bright and placid and free from spots	3		
6. "The Muzzle," &c.—The muzzle should be clean, the nos- tril expanded, and the nose white, wrinkly, and covered with short, furry, soft, velvety hair.....	5		
7. "The Ears."—Should be white, soft, thick, wide apart, and partly covered with wool.....	3		
8. "The Horns."—Should not be too close to the head and neck, nor standing out too widely, and should be free from black or dark streaks.....	4		
II. FORM AND CONSTITUTION.			
4. <i>Fore Quarter.</i>			
9. "The Neck."—Should be short on the top, deep when viewed from the side, and long below, strongly set to the head and shoulders, towards which it should be becoming deeper	5	6	
10. "The Shoulders."—Should be broad and massive as to depth and breadth, very little, if at all, above the level of the back, and well placed.....	4		
11. "The Chest."—Should be wide and deep.....	4		
12. "The Skin."—Should be thick, soft and pink.....	2		
5. <i>Middle.</i>			
13. "The Barrel."—Should be round and lengthy.....	6	6	20
14. "The Back."—Should be short, level, strong and straight	5		
15. "The Loin."—Should be broad and strong.....	4		
6. <i>Hind Quarter.</i>			
16. "The Flank."—Should be deep and straight.....	4	4	
17. "The Quarters."—Should be long and well filled up.....	4		
18. "The Thighs."—Should be long and broad.. ..	2		
7. <i>Legs, Feet, &c.</i>			
19. "The Legs."—The fore legs should be short, straight and well apart, and the hind legs should be set so as to give the hind parts a perpendicular appearance; while the bone should be heavy, but of fine texture.....	5	4	
20. "The Muscle."—Should be fine and firm... ..	2		
21. "The Hoofs."—Should be clear in color and well shaped...	3		
Carried forward.....	120	48	48

Description of Points and their Values of Medium Combing Ram.	Single Points. Aggre- gate 250.	Groups. Aggre- gate 100.	Divisions. Aggre- gate 100.		
Brought forward	120	48	48		
II. FORM AND CONSTITUTION— <i>Continued.</i>					
8. <i>Size.</i>					
22. "Size."—According the class of sheep.....	5	2	2		
III. THE WOOL.					
9. <i>Quantity.</i>					
23. "Length of Staple."—According to division.....	5	22	22		
24. "Density."—Closeness and thickness all over, but especially on the top of the shoulder and back.....	30				
25. "Evenness."—In length and density of fleece over the whole body, legs, belly, back and head	20				
10. <i>Quality.</i>					
26. "Brightness, including Lustre."—Denotes facility for taking delicate dyes.....	5	8	28		
27. "Softness."—Soft and silky to the touch, but elastic.....	8				
28. "Crimp."—The regularity of the waves and trueness of the fibre.	7				
29. "Freedom from Gare," <i>i. e.</i> , Kemp.....	5	18	18		
30. "Fineness."—According to division.....	17				
31. "Freeness."—Denoting few noils in combing and including building up of staple.... .	6				
32. "Evenness."—In the quality of the fleece over the whole body, legs, belly, back and head.....	17	2	2		
11. <i>Condition.</i>					
33. "Quality of Yolk".....	3				
34. "Fluidity of Yolk".....	2				
Aggregate numbers.....	250	100	100		

ABSTRACT.

	Single Points.	Groups.	Divisions.
Breeding and Quality.....	70	28	28
Form and Constitution.....	54	22	22
Wool.....	126	50	50
Total Marks.....	250	100	100

THE AGGREGATE NUMBER OF POINTS.

In framing a scale of points, it is of course necessary that there should be a fixed aggregate of points; and in fixing this aggregate, care must be taken to do so at a number that will give the judges, when working under the point system, sufficient scope to mark the difference in merit of the point under consideration in the different animals. The following plates represent a Medium Combing Merino Ram and Ewe, the figures on the plates corresponding with the figures in the annexed table, in which the different points are described and the maximum values attached thereto set down.

The points and values for ewes are the same as for rams, with the following exceptions:—the marks for “muzzle” are, for ewes, 4 instead of 5. Those for “horns” are omitted, and 5 marks are added for “evenness of covering.”

The above scale of points relates to medium combing sheep; by reducing the marks for “size” and “length of staple,” and increasing those for “softness” and “fineness,” the scale will be suitable for fine woolled sheep; and by increasing the marks for “length of staple” and “brightness,” and reducing those for “softness” and “fineness,” the scale will answer for strong woolled sheep.

EDITORIAL.

McKILLIP VETERINARY COLLEGE.

It is not always that we welcome the appearance of a new veterinary school in the country as a matter of joy to the veterinary profession, for it has often seemed that there were quite enough of them to supply the number of practitioners needed. But it should be a gratification to all veterinarians, when a new school is started, to see it established upon the solid basis indicated by the announcement of the McKillip Veterinary College at Chicago, Illinois. This school seems to be the first fruit of the labors of the United States Veterinary Medical Association, in the improvement of the grade of veterinary education. Its sixteen students were required to comply with the examinations recommended by the Association of Veterinary Faculties of North America, and will be obliged to take a curriculum of three years, of six months each.

We wish them every success.

SOCIETY PROCEEDINGS.

MAINE VETERINARY MEDICAL ASSOCIATION.

October, 1894.

A regular meeting of the Maine Veterinary Medical Association was held at the Elmwood Hotel, Waterville, October 10th, at 8 P. M. The President, Dr. Bailey, in the chair. The following members answered to the roll call: Drs. Bailey, Lord, Joly, Dwinal, Russell and Choate.

The minutes of the last meeting were read and accepted. The proposed amendment to the by-laws was adopted, as follows: It is proposed that Section 4, Article III—five members shall constitute a quorum for the transaction of business—shall be amended so as to read, three members shall constitute a quorum for the transaction of business.

The committee on professional fees was requested by the President to report at the next meeting.

Drs. W. D. Farnum, Rockland; Alfred L. Murch, Bangor; H. S. Usher, Hollis, Maine, were elected to membership in the Association.

Dr. Dwinal read a paper on Acute Cerebral Inflammations, as follows:

ACUTE CEREBRAL INFLAMMATIONS, EMBRACING CEREBRITIS AND MENINGITIS.

DR. C. F. DWINAL, Bangor, Maine.

To comply with a request from the President, Dr. Bailey, that I should prepare a paper upon some subject to be chosen by me, I have selected Acute Cerebral Inflammations, embracing Cerebritis and Meningitis, which I will submit to you for your consideration.

I do not propose in this to speak much from experience, but to help to bring the disease before your mind. Acute cerebral inflammations are not so commonly met with in practice as many

other diseases, and perhaps it was for this reason I selected this subject. Under this heading we have encephalitis, cerebritis or inflammation of the substance of the brain, and meningitis or inflammation of the coverings of the brain. The brain, the seat of animal life, is situated within the cranial cavity and covered or protected by three membranes, namely: dura mater, which lines the cranial cavity, pia mater, which covers the brain in all its convolutions, and the arachnoid, which is between these two. Inflammation is brought about in the brain and these membranes in several different ways, as the result of direct violence to the bones of the cranium or some disease of those bones, as the result of some specific fever, from the entrance into the system of some specific virus, as in cerebro-spinal fever, or from exposure to the rays of the sun. The most common cause, however, is from injuries to the cranial bones or disease of them, although we frequently see a sympathetic cerebral inflammation arising from some dietetic error.

Much time has been spent in endeavoring to discover some diagnostic symptoms by which to distinguish cerebral from meningeal inflammation, with some success; but we find that inflammation of the meninges quickly extends to the brain, and vice versa, therefore the distinction is not so desirable, only so at the outset.

Some of the diagnostic symptoms are these in meningitis: When the membranes are primarily affected we see the animal in a very excited condition, frightened at every object and avoiding the attendant in every way possible; he is startled at any noise or bright light penetrating the stall—in fact, spasms or convulsions, pain and delirium, are the general features of meningeal disease. Following these symptoms are diminution or loss of nervous functions.

In cerebral diseases we find the reverse of these symptoms, for from the outset or very early stages there is loss of one or more of the nervous functions, such as paralysis anæsthesia or loss of memory. The animal stands in a sleepy manner, with its head pressed against some firm object, and unmindful of anything going on about him.

The most common form of cerebral inflammation is due to some dietetic error, causing a sympathetic affection. This form may be distinguished from cerebral disease from other causes by one symptom in particular, that is the normal or even the sub-normal temperature, for in the former there is a rise in temperature.

Two cases which came under my observation will illustrate meningitis and sympathetic cerebritis.

The first, a case of acute meningitis, was in a black gelding,

which I saw about seven o'clock in the evening. I was told that in the early afternoon he had been taken away to be clipped, and being a nervous animal had caused them some trouble, and in endeavoring to punish him had struck him with something, and had placed upon his head some kind of a controlling bridle, and had thrown him down.

When I arrived, he was in a stage of great excitement, so much so that they warned me about going into the stall, which was a roomy box, saying that he was crazy and would jump on me.

I finally got up to him, and putting my hand on him, found his head very warm, pulse quick, eyes staring and bloodshot, with pupils contracted, owing to his great anæsthesia. I was unable to take his temperature; there was much pain about the head; his appetite was very good, however, and continued so throughout this sickness.

In a few days this delirium changed to the comatose condition, and the animal stood in a corner, unmindful of anything; this, however, gradually wore away, and the animal made a good recovery.

Case number two, instance of sympathetic cerebral disturbance, was in a bay mare, which had been working constantly on a farm, had been fed meal in large quantities for a few days, and suddenly refused to eat and drink, and soon began to bore her head against the wall; eyes dull, and indifferent to everything, except occasionally she would thrash her head, thus wounding it greatly, and then remain quiet again.

Her eyes and lips were swollen very much when I saw her, pulse was hard, full and slow, temperature 101 degrees Fahrenheit, respiration stertorous.

With difficulty we got her from her position in the corner. By giving her a brisk cathartic and local applications to head, she very soon recovered. She had been affected this way once before, so I was told, but after this, having advised the owner not to feed any more meal, she has never been affected.

These two cases I think very well illustrate the two common diseases coming under the subject which I have chosen for my paper this evening.

Dr. Russell read a paper on Diagnosis of Tuberculosis, which was well discussed.

A motion was made and seconded that the Association tender

the essayists a vote of thanks for the able manner in which they handled their subjects. Carried.

Drs. Lord and Choate were appointed to read papers at next meeting. The next meeting will be held at Augusta, January, 1895.

H. H. CHOATE, D. V. S., *Secretary.*

CALIFORNIA STATE VETERINARY MEDICAL ASSOCIATION.

A regular meeting of the California State Veterinary Medical Association was held on June 13th, at the Baldwin Hotel, San Francisco, Cal.

The meeting was called to order by the President, Dr. H. A. Spencer.

Upon roll call, the following gentlemen answered to their names: Drs. Whittlesey, Fox, Spencer, Sr., Spencer, Jr., Forrest, Egan, Robin, Williams, Hoggarty, Pierce, Eddy, Maclay, Jackson, Orvis and Archibald; visitor, Dr. T. T. Twombly, Logan, Utah. Under the head of Reports of the Boards of Examiners, Committees, etc., the Board of Examiners reported favorably upon the name of F. Forrest, and recommended that he be admitted to membership. The Committee on Certificates made their report, which was accepted, upon motion, and the committee discharged. The Committee on Legislative Matters reported that they had attended the State Sanitary Convention, held in San Jose, and they expressed the belief that they had accomplished a great deal towards the elevation of the veterinary profession by so doing; they also stated that they were treated very courteously, on that occasion, by the members of the medical profession who were present at the Convention.

Under the head of Admission of New Members, the Secretary moved that Dr. H. Forrest, of San Jose, be admitted to become a member of the Association; the motion was seconded by Dr. Fox, and carried.

Under the head of Reading of Papers, Discussions, etc., Dr. D. F. Fox, of Sacramento, read a very original and instructive paper on "Diseases of the Liver as a Direct Cause of Intestinal Disturbances." (See p. 340.) The President called upon Dr. Spencer, Jr., to open the discussion, which he did, by saying that he had been called upon to treat a great many cases such as described by the essayist, and he fully concurred with the essayist, in that the primary lesions in the sex cases are to be found in the hepatic gland, in the majority of cases. The discussion was also participated in by Drs. Orvis, Whittlesey, Maclay, Twombly, Archibald and Egan. They all complimented the essayist on the originality of his remarks. Some of the members, however, did not agree with the essayist, and stated that it was their opinion that if there was liver disease present in these cases, it was purely a secondary lesion. Dr. Egan mentioned a very interesting case in which the cause of death was due to hepatic lesions. Dr. Spencer, Jr., said that he had treated the disease with aloin, followed by tonics, with good success. The Secretary stated that he had treated these cases with drastic purgatives without success, but since he had applied treatment toward the amelioration of hepatic derangements, he had quite a decrease in the mortality of the cases he was called upon to treat.

Dr. Whittlesey said he had held post-mortems on several of these cases without discovering any changes in the hepatic gland.

The President closed the discussion with a few well-chosen remarks. He said this was a subject which should receive a great deal of attention at our hands; he believed that there were a great many cases of intestinal disturbances due to hepatic lesions. In closing his remarks, he stated that he thought that we were, as an Association, very fortunate in having a membership of gentlemen who were particularly desirous of introducing at our meetings subjects of which very little was known, in order that in the exchange of ideas which follow the reading of the papers, points would be raised which would lead us or enable us, to treat these cases on a more scientific basis.

Dr. J. H. Eddy, of Stockton, was then called upon to entertain the meeting, which he did by reading a very practical thesis on "Tetanus." It was followed by an animated and lengthy discussion, which was confined principally to the etiology of the disease. The following gentlemen participated in the discussion: Drs. Spencer, Jr., Whittlesey, Archibald, Orvis, Fox and Pierce.

Dr. Forrest was called upon to read a paper on "Springhalt." The essayist, without going into the pathology of the disease, described a case which he had treated, and in which he performed a cure by performing the operation known as peroneo prephalangeal tenotomy. The discussion that followed was participated in by Drs. Maclay, Whittlesey, Spencer, Jr., Twombly, Archibald and Egan.

The President closed the discussion with a few appropriate remarks.

On motion by Dr. Whittlesey, a vote of thanks was tendered the essayists for the able and masterly manner in which they had entertained the meeting.

Dr. Twombly was requested to give an account of a few experiments he had made with tuberculin, in Utah, a request which he cheerfully complied with.

The Secretary proposed the name of J. H. Edmons, of Los Angeles, for membership. The name was referred to the Board of Examiners.

On motion by the Secretary, the time of meeting was changed from 7.30 P. M. to 2 P. M., in order to accommodate the country members.

The Secretary gave notice that at the next quarterly meeting he would move to amend the By-Laws regarding the place of meeting. The matter was referred to the Board of Directors.

The President appointed the following named gentlemen as essayists for the next meeting: Drs. Egan, Skaife and Hoggarty.

The following bills were ordered paid: R. A. Archibald, \$8.75, for Secretary's supplies; J. J. Evans, \$15.00, for certificates; J. A. Cowen, \$60.00, for printing pamphlets.

The Secretary presented a communication from the Secretary of the United States Veterinary Medical Association, regarding the possibility of having some representation at the next meeting of the national organization.

Dr. Robin spoke on the use of vucatul in the treatment of fistulæ, cancers, etc., and he presented each member with a sample package.

There being no further business to come before the meeting, it adjourned, to meet in San Francisco, September 12th, 1894.

R. A. ARCHIBALD, D. V. S.,

Secretary.

SACRAMENTO, CAL.

MARYLAND STATE VETERINARY MEDICAL ASSOCIATION.

The regular quarterly meeting of the Association was held at the Hotel Renert, on Tuesday, July 24th, at 2 P. M. In the absence of the President and Vice-President, the Secretary called the meeting to order. Dr. William H. Dougherty was elected chairman pro tempore. Drs. Dougherty, Lloyd and Clement responded to the roll call. Dr. Robert Ward was present as a visitor.

The Secretary read a letter from Dr. Stuart E. Paulet, tendering his resignation from the Association, as he was not willing to abide by the code of ethics. It was voted to accept Dr. Paulet's resignation. The Secretary also read a letter from the Secretary of the Virginia State Association, extending an invitation to this Association to send delegates to the meeting at Norfolk in August. It was voted to thank the Secretary of the Virginia Association for his kindness, but to say that it would be impossible for us to count on sending delegates to represent our society at Norfolk.

Dr. Clement read a paper on the History and Purposes of the Association, which was well received by the members present.

He said :—

MR. PRESIDENT AND GENTLEMEN :

This, the first assembling of our members under the system of quarterly meetings, while it may not and probably will not be as fully attended as might be wished, still in my opinion marks an era of progress, and affords a most fitting opportunity for pledges of support and enthusiasm by every veterinarian eligible for membership. If we will but each of us pledge ourselves to make the meetings profitable by imparting our knowledge to the common good, even though but three of us may be gathered together, the benefits to each will be of inestimable value. As one who has been honored with the position of Secretary, I feel that in accepting the position I have assumed a great responsibility, and one which can be of benefit to the Society only through the most interested assistance of all of the members. The number of veterinarians is constantly increasing in our State, and there is no excuse for lack of material. With our recent legislation providing against further entrance into our ranks of persons questionably educated, I think we can wisely so modify our by-laws as to admit all graduated veterinarians, who are registered as qualified to practice.

I wish to say here that out of three practitioners graduated whom I have asked to become members of this association, two of them have declared themselves ineligible from having graduated at schools which, by our by-laws, we have debarred from representation here. Whether we should not modify our by-laws to meet these men, is a question which should be decided here to-day. I think that I have some especial right to speak upon this subject, because, if I remember rightly, I was the mover or seconder of a resolution to make ineligible to membership graduates of certain schools, because said schools did not, in our opinion, aim to make better the profession by affording a means of obtaining such an education as would benefit the public to the extent which a college diploma should guarantee. I am certain that the colleges are impressed with the importance of extending their course of study, and I believe that they are being brought to realize their position the more fully from the demand made by the U. S. Society as a standard for entrance. The State Law

which we had passed at Annapolis, while it is not as binding on the whole State as we all wished, is nevertheless based upon the standard required by the U. S. Society. It is the intention of the Examining Board to enforce the law, and it seems to me that the present is a fitting time for a general awakening of enthusiasm in our Association. I would, therefore, recommend that all registered graduated veterinarians be eligible for membership to our Association, and that our associate membership be increased by soliciting the co-operation of some of our fellow practitioners who, through no fault of their own, have not had the benefit of a college education.

I have met with many of the latter class, as doubtless have all of you, who would be encouraged by the recognition of this Society, and from whom all of us could learn many facts, as well as in turn impart to them useful information. For my part, I would much prefer a society many of whose members were non-graduates but who were in earnest, than a society whose membership was composed entirely of graduated men who are either too ignorant or too indolent to enjoy the advantages of active participation in the transactions of such a society as this.

If, after repeated solicitation, our members do not attend, and attending do not participate in the reading of papers and discussion of subjects brought before them, then it is time to drop their names from the list of membership, and fill their places with men who are professedly of a lower standard but who perhaps actually possess more intellectual merit, and who are not so pressed with professional cares and responsibilities that they have no time to learn from others or to impart a grain of information to those who are not so fortunate in the opportunity of accumulating practical experience from a very extended clientele.

Our Association, Mr. President, is one of the oldest, and, though its career has been rather varied, can well be proud of its existence. According to the records in my possession as Secretary, I find that the first call for a meeting was made in 1885, and that the first meeting was held on Monday evening, Sept. 28th, of that year. Drs. Dougherty, W. H. & A. H. Rose, Miller of Camden, Moulton, Steck, Spranklin and Martinet were present. All present joined the new Society. Officers were elected, and at the third meeting the Constitution and By-Laws were presented and adopted, and on Oct. 20th Articles of Incorporation, as follows :

CERTIFICATE OF INCORPORATION OF MARYLAND STATE VETERINARY MEDICAL SOCIETY.

Know all Men by these Presents, that we,

William Dougherty,
T. W. Spranklin,

Wm. H. Martenet,
A. H. Rose,

And C. L. Moulton,

Geo. M. Steck,
W. H. Rose,

Being citizens of the United States, and a majority of whom are citizens of the State of Maryland, do hereby certify that we do, under and by virtue of the General Laws of this State, authorizing the formation of Corporations, hereby form a Corporation under the name of *The Maryland State Veterinary Medical Society* (of Baltimore City).

We do further certify that the said Corporation so formed is a *Corporation for the Advancement of Veterinary Science*; that the term of existence of the said Corporation is limited to forty (40) years, and that the said Corporation is formed upon the articles, conditions and provisions herein expressed, and subject in all particulars to

the limitations relating to corporations which are contained in the General Laws of the State.

We do further certify that the operations of the said Corporation are to be carried on in the State of Maryland, and that the principal office of the said Corporation will be located in Baltimore City.

We do further certify that the said Corporation will be managed by a Board of Censors, and that Wm. Dougherty, T. W. Spranklin, Geo. M. Steck, A. H. Rose and W. H. Rose are the Board of Censors who will manage the affairs of the said Corporation for the first year.

In witness whereof, we have herewith set our hands and seals this 20th day of October, in the year eighteen hundred and eighty-five.

Test :

STEPHEN S. CLARK.

WM. DOUGHERTY, D. V. S. [SEAL]

WM. H. MARTENET, D. V. S. [SEAL]

GEO. M. STECK, D. V. S. [SEAL]

CHARLES L. MOULTON, D. V. S. [SEAL]

THOMAS W. SPRANKLIN, D. V. S. [SEAL]

ALVORD H. ROSE, D. V. S. [SEAL]

} STATE OF MARYLAND,
{ BALTIMORE CITY, TO WIT :

Before the subscriber, a Justice of the Peace of the State of Maryland, in and for the city of Baltimore, personally appeared, on the 20th day of October, in the year of eighteen hundred and eighty-five, William Dougherty, Wm. H. Martenet, Geo. M. Steck, Charles L. Moulton, Thomas W. Spranklin and Alvord H. Rose, and did severally acknowledge the foregoing certificate to be their act and deed.

STEPHEN S. CLARK, J. P.

I, George William Brown, one of the Judges of the Supreme Bench of Baltimore City, do hereby certify that the foregoing certificate has been submitted to me for examination, and I do further certify that the said certificate is in conformity with the provisions of the law authorizing the formation of said Corporation.

GEO. WM. BROWN.

It was within eight days of nine months after its organization before a paper was offered for the consideration of this society, although informal discussions appear to have been indulged in frequently. Then, as now, do we see the names of members who promised to read papers at the next meeting, but in some cases the next meeting has to them apparently never come. Dr. W. H. Wray, had the honor of reading the first paper, one on contagious pleuro-pneumonia, which was well received and gave rise to a general discussion of the subject. There have been seventy-five meetings of our Association held, but at only sixty-six was there a roll call, and some of the meetings were not even recorded. The average attendance at the sixty-six meetings at which the roll was called was six. The average membership has been about ten, confined almost exclusively to practitioners in Baltimore City, and including those associated with the Bureau of Animal Industry. At thirty-four of the sixty-six meetings reported, papers were read or demonstrations given. Many of our meetings have been most interesting and instructive. Most of us present remember well the interesting meetings held by lamp light in the third story of the building on St. Paul Street, at the office of the inspectors of the Bureau of Animal Industry, and later, when we met in the hall of the Medical Chirurgical faculty. We all seemed to

be enthusiastic then—why should we not be now, when the material is greater, and the facilities for obtaining information growing year by year? Why should we not, with the ever-increasing sources of information, come prepared, each and every one of us, at every meeting to offer some information from our store of experience for the benefit of our fellow members? It matters not so much how limited our membership, if we but methodically set to work to obtain the greatest possible information from each other by honestly and modestly laying our observations before the meeting, thereby inviting discussion. I sometimes think it a pity that we did not at first assume the more modest, and to my mind more appropriate title of Society, unless we should anticipate an aggressive tone in the way of future legislation. Such has not been our method so far, and I am inclined to hope never will be. Rather have we aimed to assist as a body the profession at large in any movement toward the public good, and I think that in a great measure we have succeeded.

To be sure, we have in many cases not accomplished all that we wished, but I am certain that we have made our influence felt, and if we but keep on, we will reap the fruits of our reward. We have held meetings, and gone to considerable trouble and some expense to inform the public of the danger lurking in the meat and milk supply of our city and State. We have shown the necessity of veterinary experience of the City and State Boards of Health, and we assisted with our money and our time in initiating the measure which resulted in legislation for the protection of our profession. I am fully of the opinion that our agitation of the question of a supervision of the milk and meat supply has had a great deal to do with the appointing of inspectors, worthless though they may be in our eyes, and, perhaps, probably worse than useless so far as the consumers are concerned, but it is a beginning, and if the public in the future do not care for anything better, it is not our fault, and we can probably stand it. I am convinced that, however, the time is coming when better things will be demanded, and when the public really demands a thing in this country, they generally get it. Americans are not slow of observation, and it is as certain that trouble will follow the appointment of inexperienced men to go about deciding whether milk is deadly or not simply by putting a register into the fluid, which they are taught mechanically to read, or to decide on the merit of meat by its smell, as it is that a child will get cut if it plays with sharp instruments. The practice of appointing inexperienced men to such a position as inspector of meat and milk is a fraud upon the public, a gross injustice to the producer, and an insult to our profession. Yet I would not be one to publicly proclaim this fact, for I believe that our influence will be of greater weight by the better education of the public and our public officials to the importance of the question, in a quieter and less aggressive manner. The time is sure to come, in the near future, when some of us will be called upon to give our opinion fearlessly and honestly. Then it will become our duty and our privilege to uphold that which is good and condemn that which is bad in the present system. Of how much more weight, Mr. President and gentlemen, will be our opinion if we have taken the precaution to fortify ourselves with the knowledge best gained by mutual intercourse, the expression of opinions gained by discussion based upon observation and extended reading.

How can we do this, except by a systematic gathering such as this? Yes, gentlemen, there is reason for the existence of such a society as this, and every veterinarian who is eligible to membership makes a very grave mistake, in the opinion of the best element of the profession throughout the world, in not taking advantage of it. We should respect ourselves and respect each other; then, and not until then, will the people respect us and heed our warnings. We must go on, and we must

awaken enthusiasm among our members. It is not to be expected that every one of us can attend each meeting, such a thing would be impossible, but the same ones should not be absent continuously, and the same ones always present.

If we have grievances, let us make them known, and if they are not corrected, let us assert ourselves at the annual election of officers. We have shown more than once what we can do. We gave the United States Society as good a reception as they ever had anywhere, and we held one of the best meetings here, which up to that time had ever been held. We often have as large a representation at the meetings of the United States Society as we have attendance at some of our State meetings.

We have the reputation in that Society of being enthusiastic and working in harmony. At the same time, they must wonder why they never see any mention of our existence in the journals. But such lack of enthusiasm, so well known to us all, of late, is not to exist longer, I am sure, for there is no reason in it, and it only needs a little exertion on the part of each one of us to make our Association a grand success.

The meeting then adjourned.

A. W. CLEMENT,

916 Cathedral St., Baltimore, Md.

July 24th, 1894.

ITEMS.

DR. SALMON, Chief of the Bureau of Animal Industry, has just ordered a return to Ireland of an importation of Shropshire sheep, landed at the Port of Baltimore, suffering from foot and mouth disease.

THE Des Moines, Iowa, Veterinary College has closed its doors for lack of support. The day of two year schools, imperfectly equipped, has gone in this country, never to return.

THE English reading veterinary world will soon have an extremely valuable contribution to their literature, in the translation, by Prof. W. L. Zuill, of Philadelphia, of the German work of Messrs. Friedberger and Fröhner, with the notes of the French translators and selections from those of Prof. Trasbot.

McKILLIP VETERINARY COLLEGE, of Chicago, with a three years course, starts her initial year with sixteen matriculants, all of whom have passed the necessary entrance examination, as adopted by the Association of Veterinary Faculties of North America. This is a high compliment for a new school of advanced curriculum, and speaks well for the future profession in America.

HAD all the existing and prospective veterinary colleges commenced their courses in North America this year, we would have had twenty veterinary schools to furnish new recruits to the ranks. Surely more than there could be any need of!

IF the United States Veterinary Medical Association, in her thirty-one years of existence, has not many laurels to wear, she has one to adorn her crown that will shine long to her honor and glory—her persistent agitation and demand for a higher standard of veterinary education. Let the good work go on.

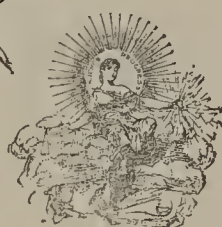
IN at least one of the Western veterinary colleges, with a two years course of six months each, there is a great falling off in the matriculants for the year. Will not all the schools soon recognize that they must broaden their course or suffer materially in the growth of and respect for their schools?

VETERINARIANS of Baltimore, and many of the members of the United States Veterinary Medical Association, were willing contributors to a fund presented to the widow of our late associate, Dr. C. B. Michener.



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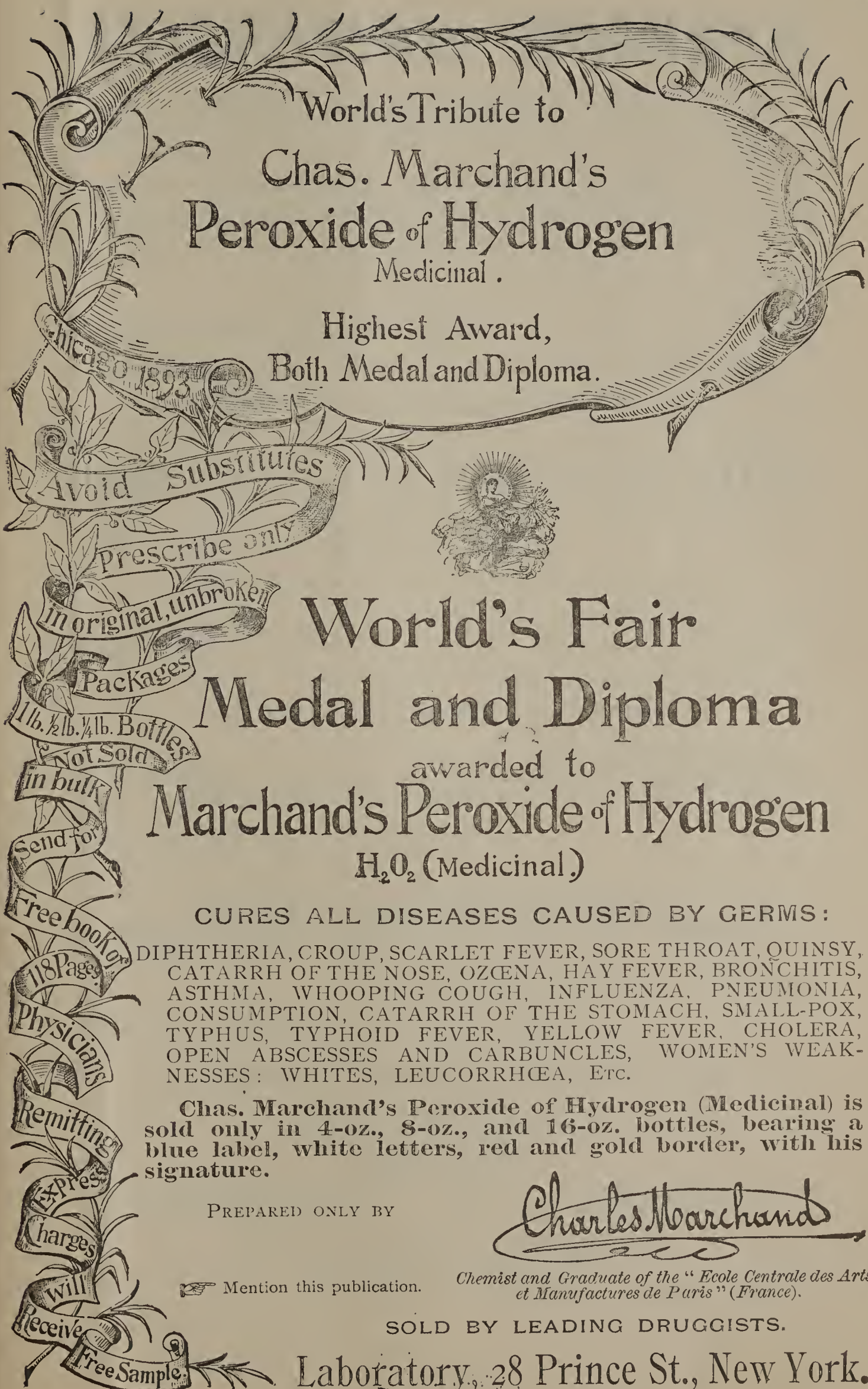
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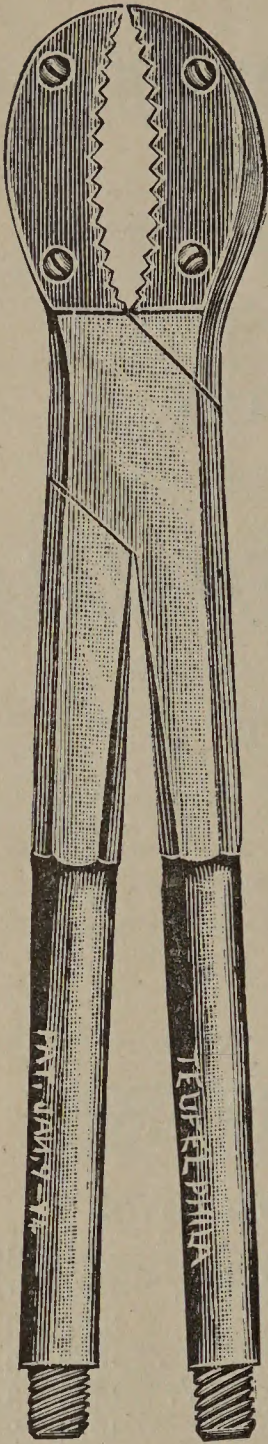
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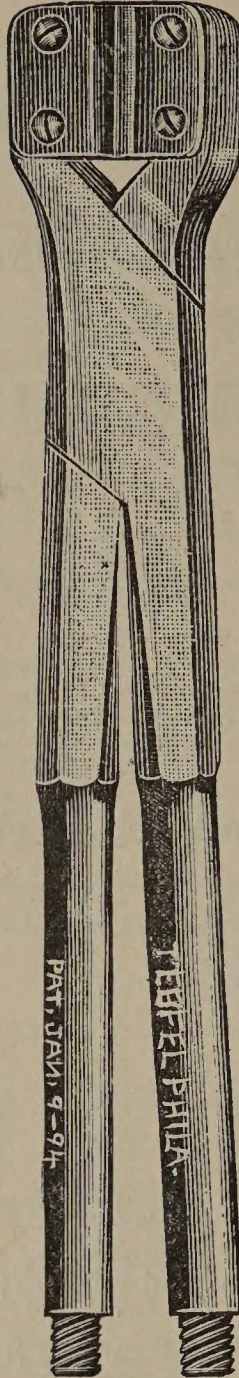
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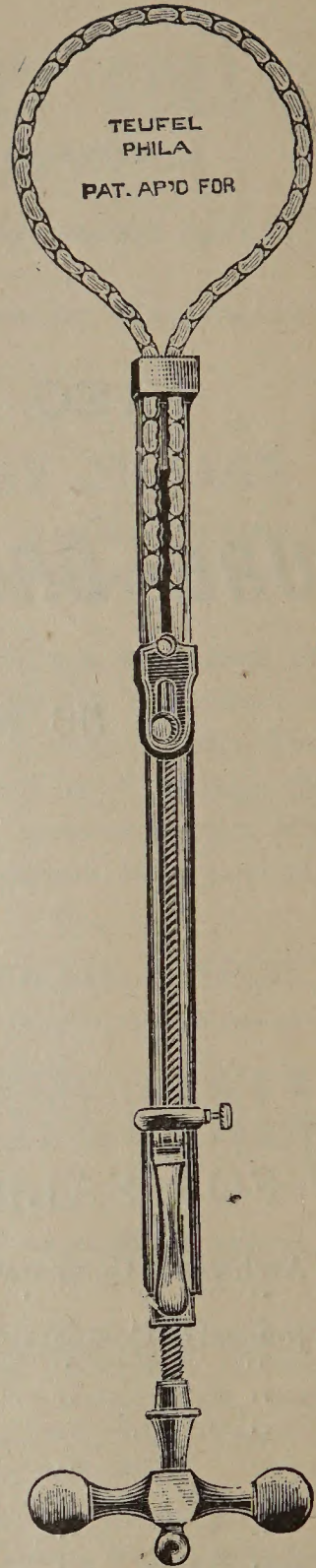
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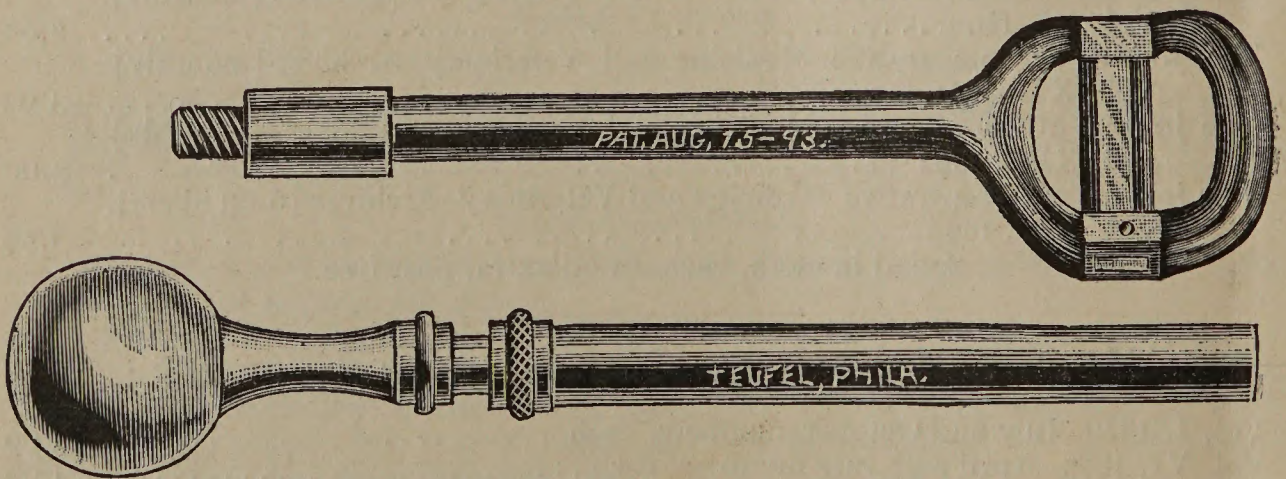


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